Knitted Outerwear Times

the official publication of the national knitted outerwear association
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sweaters • swim suits • infantswear • knit fabrics • polo shirts • gloves • headwear

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Vol. 30 MONDAY, AUGUST 28, 1961 No. 36

Gov't Procurement

18 Mills Submit Sweater Bids

PHILADELPHIA, Pa.—The following firms bid at the Military Clothing and Textile Supply Agency under QM-86 covering 171,440 men's dark blue wool sweaters; f.o.b. destinations; (a) 37,216 New Cumberland Depot; (b) 56,320, Richmond Depot; (c) 1,488 Atlanta Depot; (d) 41,184, Utah Depot; (e) 35,232, Sharp Depot-Calif., all firms using domestic wool.

Ohio Knitting Mills, Cleveland (a) 15,000 at $2.85; 12,912 at 2.85; (b) 20,000 at 2.96; 20,000 at 2.96; 2,240 at 3.00; (d) 20,000 at 3.09; 20,000 at 3.09; 16,184 at 3.15; (e) 15,000 at 2.94; 15,000 at 2.99; 5,230 at 2.99; min., 20,000.

Tartan Knitting Mills, Phila.: (a) 2.9025; (b) 2.9575 (c) 3.07; (d) 3.1175; (e) 2..965; 1/10%-20; accept Atlanta dest. only if awarded another dest.

ECM Corp., Manchester, N. H.: (a) 12,405 at 2.9027; 12,405 at 2.9527; 12,406 at 3.0027 or 27,216 at 2.9327; (b) 18,773 at 2.9961; 18,773 at 3.0461; 18,774 at 3.0961 or 56,320 at 3.0261; (c) 496 at 3.179; 496 at 3.229; 496 at 3.279; or 1,480 at 3.209; (d) 13,728 at 3.1912; 13,728 at 3.2412; 13,728 at 3.2912; or 41,184 at 3.2212; (e) 11,744 at 2.9584; 11,744 at 3.0084; 11,744 at 3.0584; or 35,232 at 2.9884; ½%-20.

Lion Knitting Mills Co., Cleveland: (a) 3.669; (b) 3.759; (c) 3.857; (d) 3.869; (e) 3.695; ½%-20; min., 12,000.

Pottsville (Pa.) Mills: (a) 3.73; (b) 3.92; max., 93,636; min., 37,216.

Highland Knitting Co., Phila.: (a) 30,000 at 3.575; ½%-10; max. and min., 30,000.

Standard Knitting Mills, Cleveland: (d and e) 4.16; ½%-20 max., 76,416; min., 50,000.

Fine Craft Knitwear, N. Y.: (c) 3.625; (d) 14,000 at 3.625; (e) 13,312 at 3.625; max. 28,800; min. 6,000.

Max Lowenthal & Sons, Rochester, N. Y.: (a) 24,000 at 2.44; 13,216 at 2.55; (b) 24,000 at 2.47; 12,000 at 2.55; 20,320 at 2.60; (c) 3.05; (d) 24,000 at 2.66; 17,184 at 2.71; (e) 24,000 at 2.50; 11,232 at 2.55; 1/10%-20; min., 12,000.

Suffolk Knitting Co., Lowell, Mass.: (b) 3.42; 1/20%-20; min., 28,160.

Novelty Knitting Mills, Phila.: (e) 20,000 at 4.09; ½%-30; max., and min., 20,000.

Rudolph Knitting Mills, Brooklyn: (a) 2.845; (b) 2.895; (c) 3.025; (d) 3.10; (e) 2.96; min., 50 per cent.

Richline Knitting Mills, Phila.: (b) 3.27; min., 30,000.

Alvin Knitting Mills., Phila.: (b) 3.74; min. 28,000; (c) 3.76; min., all; (d) 3.79; min., 22,000; 1/10%; ½-20; min., 23,488, for b and c combined.

Diane Knit Fabrics, Inc., South Norwalk, Conn.: (a) 3.19; (b) 3.26; (c) 3.38; d) 3.41; (e) 3.25; max., 90,000.

Bergman Knitting Mills (a) 3.28; (b) 3.34; (c) 3.46; (d) 3.49; (e) 3.34; 1/2%-10; max., 60,000; min., 24,000.

Clover Knitting Mills, Phila. (a) 3.348; (b) 3.441; (c) 3.589; (d) 3.626; (e) 3.443; 1/20%-20.

Harmon Knitwear, Inc., Marinette, Wis.: (accepted late bid) (d) 5.046; (e) 4.895; 1%-20.

Japanese Imports

Impasse Marks Tokyo Negotiations; Nields, Korzenik U. S. Team Advisors

TOKYO (Special to KNITTED OUTERWEAR TIMES)—A. U. S. offer of a five per cent increase faced Japan's demand for a 30 per cent increase in import quota negotiations that began here this week, covering cotton textiles, knitgoods and apparel. No indication was yet apparent at midweek of any way out of the impasse. Present among industry advisors named to consult with the U. S. delegation are James F. Nields, president, and Sidney S. Korzenik, executive director and counsel of the National Knitted Outerwear Association. The two NKOA officials also served as industry advisors to the U. S. negotiators at the GATT parley in Geneva in July.

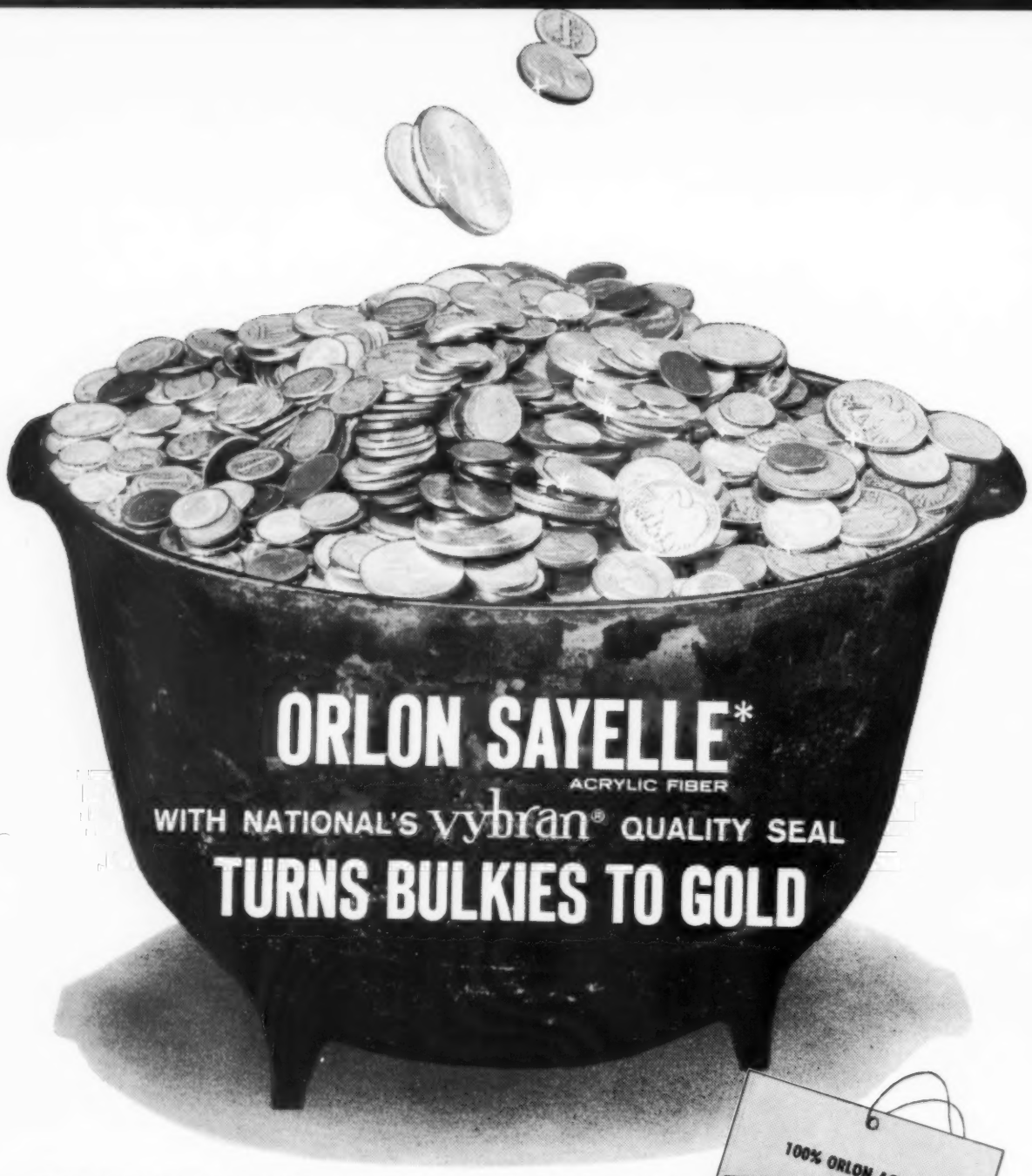
A certain amount of political significance is being attached to the outcome of these talks by the Japanese. They complain that they lost their former proportionate share of U. S. imports by restraining exports to the limits set under the five-year arrangement now about to expire, while Hong Kong and other countries remaining unrestricted picked up business Japan would have had. In the light of a domestic sales decline cause by the recession U. S. industry is in no mood to make concessions. The U. S. had announced its offer before conference began hoping to induce Japan's signing of the Geneva agreement developed in July. But Japan has taken the position that it will not accept the Geneva pact unless it obtains satisfactory private arrangements with the U. S. on quoats now under discussion. The U. S. had made its five per cent offer in expectation of rolling back Hong Kong by 30 to 35 per cent. Hong Kong has been put on notice to this effect but formal negotiations will probably not be undertaken toward such agreement until after the Tokyo talks are concluded.

The U. S. delegation consists of Warren Christopher, special assistant to the U. S. State Department; Hickman Price, astant secretary of commerce; and Leo Wertz, assistant secretary, U. S. Labor Department.

Besides Mr. Nields and Mr. Korzenik, other industry advisors are J. M. Cheatham, president Dundee Mills, and president American Cotton Manufacturers Institute; Robert C. Jackson, executive vice president, ACMI; Warren Mullin, Apparel Industry Committee on Imports; and Edward Morris, president, Blue Bell Mfg. Co; William E. Reid, president Regal Textile Corp.; Seabury Stanton, president, Berkshire-Hathaway, Inc., and chairman of Northern Textile Association; William F. Sullivan, president, National Textile Association.

Labor advisors are Dr. Lazare Teper, research director, International Ladies Garment Workers Union, and Milton Fried, research director, Amalgamated Clothing Workers of America. Both unions are AFL-CIO affiliates.

SPECIAL ISSUE: Annual Dyeing and Wet Processing Review



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Dyeing & Wet Processing Review

Water Repellents For Laminated Knits

By CHARLES REICHMAN, Editor

WATER repellent compounds, long regarded as ineffective finishes for knitted fabrics, are now being applied in increasing volume on laminated knitted fabrics used in rain coatings and some types of heavy outerwear garments. Until the appearance of knitted foam-backs on the trade scene, probably no more than a piddling quantity of water repellent finishes were applied to knitted apparel fabrics. Today, however, manufacturers of water repellents are coming to regard the burgeoning laminated knits business as a lush new market for their chemicals.

Figures on the extent to which water repellent finishes are used in foam-bonded knits are hard to come by. Some observers guess that upwards of 40 per cent of knitted foam-backs are presently being treated with some form of water repellent finish. Others claim the volume is considerably smaller, pointing out that rainwear is only one small end-use segment for laminated knits and that the larger proportion of these fabrics are channeled into apparel areas in which water repellency is not a significant factor.

About 20 to 25%

The correct figure probably lies somewhere in between these two extremes. Conservatively, it is estimated that no more than a quarter—more likely about 20 per cent—of the circular and warp knitted fabrics presently being bonded to urethane foam are treated for water repellency.

One of the factors that has restricted more extensive application of water repellent finishes to foam-backed knitted fabric has been the broad use of loosely knitted bulky rib fabrics in these laminates. As use of finer gauge knitted constructions in laminated knits continues to grow, however, it may be expected that the yardage of laminated knit cloth treated for water repellency will be greater.

Effectiveness of water repellents on knitted fabric—Historically, knitted yardgoods manufacturers have been less prone than producers of woven fabrics to make use of water repellent finishes. Probably the chief reason for this is that the tight construction of most woven fabric helps create an effective structural bar to water penetration, while the open loop construction of knitted cloth is a distinct drawback to making the fabric resistant to water penetration.

Research Confirms

This is confirmed by a number of research studies including the classic project on the comparative rain resistance of various wool fabrics conducted by the Harris Research Laboratories as part of an Army Quartermaster program on water resistance of wool for military clothing. This QM study disclosed that performance of knitted wool fabrics in water resistant tests was on the whole poorer than woven fabrics of comparable weight. The knitted fabrics analyzed included a 26-ounce knitted cloth and 13-ounce tubular knitted fabric. These were compared with various types of woven fabrics of the same relative weight. The 26-ounce knitted cloth, for example, was examined along with a 21.5-ounce melton material and a napped woven fabric. The tubular knitted fabric was studied in the context of a 20-ounce melton, a 20-ounce flannel, a 13-ounce woven felt and an 18-ounce elastique.

Performed Poorly

In both instances, the knitted fabrics came through the laboratory water repellency tests with lower ratings than the woven fabrics with which they were grouped. Although the very heavy fabrics—the melton and the napped in the woven classification, and the 26-ounce knitted cloth — showed no clear evidence of penetration after several hours of exposure to rain spray, the performance of the 26-ounce knitted cloth was clearly inferior to that of the two woven fabrics.

The 13-ounce tubular knitted fabric also performed poorly in comparison with the woven fabrics of similar weights.

Failure of the knits to do as well in the water repellency tests as the comparable woven fabrics was ascribed by Harris Laboratories researchers chiefly to the large interstices characteristic of knitted fabric. Apparently, the intermeshed loop structure of knitted cloth presents a more open surface to water than woven fabric which consists of a close interlacing of warp and filling threads.

Types of Water Repellents—Water repellents are formulated from water resistant waxes or chemical compounds which are wax-like in performance. In action, water repellents repulse water because the molecules of the water repellent finish and the molecules of water have no affinity for each other. When a water repellent is properly applied to a knitted or other textile fabric, it lays down on the surface of the material an invisible shield which bars the penetration of water.

It is important that a distinction be drawn between a fabric that is water repellent and one that is waterproof. A fabric which is water repellent is not per se waterproof. The former will repel water only for a certain period of time, after which the water will manage to work its way through the fabric. This is so largely because a water repellent fabric is not completely impervious to air. The fabric, in other words, has facility to breathe, with the result that moisture is not built up on its inside.

Waterproofing Explained

Waterproofing, on the other hand, implies that the passage of water through the fabric is completely barred. A fabric that is waterproof is so sealed off that it becomes impervious to air and prevents the water vapor which forms on the inside of the fabric to pass through the material. Waterproofed fabrics are thus hot and uncomfortable.

Water repellents may be classified in several different ways. Basically, however, they may consist of waxes of various

(*Continued on Page 5*)

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types in combination with various metal salts such as aluminum sulfate or acetate, zirconium and zinc and chromium salts. Others consist of long-chain hydrocarbons which break down under heat to a fatty component, an ingredient which is then capable of polymerization. A third popular and more recent class of water repellents consists of silicones which are generically classed as organo-silicon oxide polymers. Silicones are derived from silicon, a component of sand.

Silicones possess greater durability in laundering and dry cleaning than the older classes of water repellent finishes. Silicones have the added advantage of being effective repellents for certain types of stains and soils. They also perform well as thread lubricants to prevent needle failure due to overheating and as a slippage agents for easing the feeding of foam-backed knitted fabrics over the surface of a sewing machine. Many of the older wax base water repellents also perform well as fiber lubricants because of their heavy fatty content.

Classes of Silicones

Silicones may be classified as those applied from organic solvent solutions and from colloidal suspension or aqueous emulsions. Most silicones are compatible with textile finishing resins with the result that it is possible to impart the silicone water repellent simultaneously with a thermosetting shrinkage control resin.

The theory behind the use of wax bases in water repellent finishes stems from the fact that natural fibers in the unscoured state are difficult to wet out because they contain a concentration of fatty ingredients. In raw cotton, the built-in water repellent is wax; in wool, it is grease. When wool or cotton are scoured before dyeing, the wax and grease are removed from the fibers with the result that they lose their original water repellent properties. Synthetic fibers, of course, do not contain the natural fatty substances found in cotton and wool; however, these fibers tend to be inherently hydrophobic.

The mechanism through which fabrics resist wetting via application of a water repellent finish varies with the type of finish that is applied. Whether the compound is a silicone type or a wax and metallic salt emulsion, the fabric receives its water repelling property through the application on the fabric's surface of a fine film which acts as a water barrier.

Among the best known wax emulsion finishes are such products as Cravenette LK, manufactured by Cravenette Company, Aquarol Y, a wax aluminum compound manufactured by the Arkansas Company, and Zelan S, a product of the DuPont Company. Among the more popular silicone water repellents are the various Syl-mer products of Dow Corning Corp., Scotchgard, made by Minnesota Mining & Manufacturing Co., Hydro-pruf, made by the Arkansas Company, and the Cravenette silicone type water repellents.

The waxy component of a water repellent finish may consist of any type of this substance. Mostly, however, it is paraffin wax, although bees' wax is sometimes also used in the formulations.

Method of Application—The methods of applying the various types of water repellent finishes described above differ, depending upon the chemical composition of the water repellent agent and the degree of durability desired. Generally, it may be said that the greater the durability, the longer the processing time and the higher the temperature at which the water repellent finish is dried and cured.

Application of water repellent finishes, whether of a wax emulsion and metallic salt type or a silicone, usually is done after dyeing. Silicones can be applied on foam-bonded; knitted cloth only after the fabric has been securely laminated to the urethane foam; otherwise delamination would occur. The non-silicone types of water repellents, however, can be affixed to the knitted fabric prior to bonding to foam.

In the preparation of a silicone formulation, a catalyst is required. No such accelerating agent is needed for the non-silicone types of water repellent compounds. Different catalysts are used for the various silicone products on the market. The catalyst for Syl-mer 72, for example, is a product called Catalyst 62; for Arkansas' Hydro-Pruf it is Cobelfix.

Apply Via Padding

Most water repellent finishes are applied to knitted fabric via padding techniques. However, some may be exhausted on the fabric or sprayed or dip applied. Padding is the preferred method. Finishing plants equipped to handle conventional thermosetting resins used to impart shrinkage control to cotton knit fabrics have suitable equipment for padding water repellent finishes onto laminated knitted cloth.

To assure proper application of the finish, the knitted fabric must be free of dyeing assistants such as starches, gums, soaps, synthetic detergents. Otherwise, the degree of water repellency and its durability will be adversely affected. Details as to the percentages of water repellent finish on the weight of the fabric, the pH of the emulsion, etc., vary according to the specific water repellent compound and the type of fabric to which it is being applied.

Following application of the finish by padding or long bath exhaustion, the fabric is dried. Drying temperatures are also again dependent upon the type of finish and the fibrous content of the fabric. Generally, drying temperatures range in the neighborhood of 250 to 300 degrees Fahrenheit. Drying can be done in any type of conventional knitgoods dryer of the loop, reel or basket types or on an enclosed tenter frame.

Curing Finish

The final step in affixing a water repellent finish to laminated knitted cloth or unbonded fabric destined for lamination is curing. Not all water repellent compounds require curing. Some give reasonably good results at normal drying temperatures or by exposure to the atmosphere.

Most wax and metallic salt water repellent emulsions require no curing and produce fabrics with a reasonably high spray rating and possessing relatively good durability of the water repellent to laundering and dry cleaning. For optimum results, however, curing is recommended. This is especially true of silicones, although there are some silicone types which require no curing. Such a silicone is Syl-mer 61 which is applied by exhaustion and dried by conventional fabric finishing means. However, another Dow Corning silicone water repellent finish, called Syl-mer 72, requires curing.

Curing time and temperature depend upon the nature of the fiber and the degree of durability desired. Laminated knitted fabrics consisting entirely or in a large part of natural fibers are cured at lower temperatures than foam-backed fabrics knitted wholly or chiefly of synthetic fibers. The duration of the curing is dependent on the temperature at which this operation is carried out. As a rule, the lower the temperature the longer the curing time. The time spread is from five to seven minutes; the temperature range from 310 to 350 degrees Fahrenheit.

After Rinse

Following curing, no subsequent neutralizing and rinsing treatment is required in silicone application unless a resin of some type was co-applied with the silicone to the fabric.

In neutralizing and rinsing following curing, an ammonia solution may be employed which is followed up by a rinse at a tepid temperature. The goods are then again dried, with drying temperatures hovering about the 300 to 350 degree Fahrenheit level. Equipment used for drying at this stage of processing is of the conventional type.

The non-silicone types of water repellent finishes which are subject to curing also need no after-wash if thermosetting resins of the wash-and-wear type or shrinkage control class are not affixed to the fabric simultaneously with the water repellent compound.

FACTS ABOUT WATER REPELLENTS

A comprehensive run-down of technical data on leading types of wax and metallic salt and silicone water repellent compounds is published on Pages 5 to 9. Details are given on chemical basis of the compound, method of application, industry procedure, equipment, drying and curing temperatures, duration of these steps, substantivity of the water repellent to natural and synthetic fibers, spray rating, pH of emulsion or solution, etc.

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Water Repellents For Foam-Backed Knitted Fabrics

TRADE NAME	MANUFACTURE	CHEMICAL BASIS	FIBER SUBSTANTIVITY	SPRAY RATING	METHOD OF APPLICATION
AQUAROL Y	Arkansas Company, Inc., Newark, N. J.	Wax-aluminum emulsion compound, non - durable type.	All textile fibers.	100%	May be applied before or after, depending on type of lamination, fusion or adhesive 4 to 6% on bath volume depending on fabric. Dry only. Aquarol Y is sensitive to high temperature and, therefore, a maximum temperature of 90 degrees F. is suggested when preparing the bath or applying it to the goods. The goods are run in the bath for 15 to 20 minutes or until completely saturated and then extracted and dried in the usual manner. If the goods are wet before entering the machine, use 6 to 8% of Aquarol Y.
CRAVENETTE 330	The Cravenette Co., U.S.A., South Hackensack, N. J.	Silicone type.	Cotton, nylon, rayon and synthetic blends. (Only after lamination of fabric to foam.)	90-100%	May be applied only after lamination by padder method. Concentrations of various products necessary for maximum degree of water repellency depends upon fiber content, weight of fabric and pickup. Cravenette 330 must be dried, then cured at approximately 320 degrees F. for 4 minutes. Time and temperature may be adjusted in either direction depending on weight of fabric, pickup and ability of both fabric and dyestuffs to withstand increased temperature.
CRAVENETTE LK	The Cravenette Co., U.S.A., South Hackensack, N. J.	Wax emulsion.	Almost all fibers and blends. (May be applied before lamination.)	90-100%	Cravenette LK requires only drying temperatures; curing not necessary.
CRAVENETTE SWS	The Cravenette Co., U.S.A., South Hackensack, N. J.	Silicone type.	Wool and wool blends (only after lamination of fabric to foam).	90-100%	May be applied only after lamination by padder method. Concentrations of various products necessary for maximum degree of water repellency depends upon fiber content, weight of fabric and pickup. Cravenette SWS requires only drying temperatures; curing not necessary.
DRILENE L	Refined Products Company, Lyndhurst, N. J.	Stearamide emulsion.	Cotton and synthetics.	90-100%	8-10% Drilene L based on weight of solution is applied on a padder, then dried and cured at 300-320 degrees F. for 5-7 minutes.
DRILENE N-2	Refined Products Co., Lyndhurst, N. J.	Wax-metal salt.	Cotton, rayon, wool and synthetic fiber blends.	100%	10-15% Drilene N-2 based on weight of solution is applied on padder, then dried on regular drying equipment. No curing is required.

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Water Repellents For Foam-Backed Knitted Fabrics

TRADE NAME	MANUFACTURE	CHEMICAL BASIS	FIBER SUBSTANTIVITY	SPRAY RATING	METHOD OF APPLICATION
ECCOPEL Z	Eastern Color & Chemical Co., Providence, R. I.	Semi-durable Zirconium type water repellent.	Applicable to all natural and synthetic fabrics except fiberglass.	100%	Padding application at 8-10%; no curing required.
HYDRO-PRUF FC	Arkansas Company, Inc., Newark, N. J.	Durable silicone water repellents.	All textile fibers.	100%	May be applied before or after depending on type of lamination, fusion or adhesive, may be applied by padding or spraying. 4 to 6% on bath volume depending on fabric. Dry 250 degrees F.; cure 310 degrees F. for 5 minutes. On wool: dry and cure in one operation at 260-280 degrees F. for 7-10 minutes.
HYDRO-PRUF SPL	Arkansas Company, Inc., Newark, N. J.	Durable silicone water repellents.	All textile fibers.	100%	May be applied before or after depending on type of lamination, fusion or adhesive. 4 to 6% on bath volume depending on fabric. Dry 250 degrees F.; cure 310 degrees F. for 5 minutes.
HYPEL	Burkart-Schier Chemical Co., Chattanooga, Tenn.	Wax emulsion-aluminum salt.	All fibers.	90-100%	Applied as finish in pad; 5-10% on weight of goods; no cure required; no adverse effect on hand, colors or aging properties.
QUAKER PROSOTEX S-4	Quaker Products Corp., Conshohocken, Pa.	Thermosetting resin with attached hydrophobic groups.	Product is not substantive. It may be applied by pad to cotton, rayon, modified rayon fibers, acetate.	90-100%	Application of 6% Prosotex S-4 on the weight of the fabric via padder. After impregnation, the fabric should be dried, cured at 315 degrees F. for 90 seconds. Zinc nitrate or ammonium sulfate are the recommended catalysts.
RANEOFF S	Eastern Color & Chemical Company, Providence 4, R. I.	Not indicated.	Applicable to all natural and synthetic fabrics except fiberglass.	100%	Padding at concentrations of 1-1.5% with appropriate catalyst. Curing required for optimum results.
REPELLO CI-F	Scher Brothers, Allwood, Clifton, N. J.	Cationic dispersion of long chain hydrocarbons with Zirconium Salt Electrolyte.	Effective on all fibers.	100% with minimum solids applied.	Repello CI-F can be exhausted onto yarn or piece goods from a long bath after the dyeing cycle or padded onto tubular knit or piece goods as a finishing operation, either before or after lamination. For pad application a 7 to 10% solution of Repello CI-F is prepared.
REFELEX	Dixo Company, Inc., Rochelle Park, N. J.	Long chain hydrocarbons containing hydrophobic ends, various waxes.	All fibers.	100%	Can be spray or dip applied from non-aqueous solutions. Can be quickly cured with heat or steam. Approximate take-up 4 lbs./100 lbs. goods.

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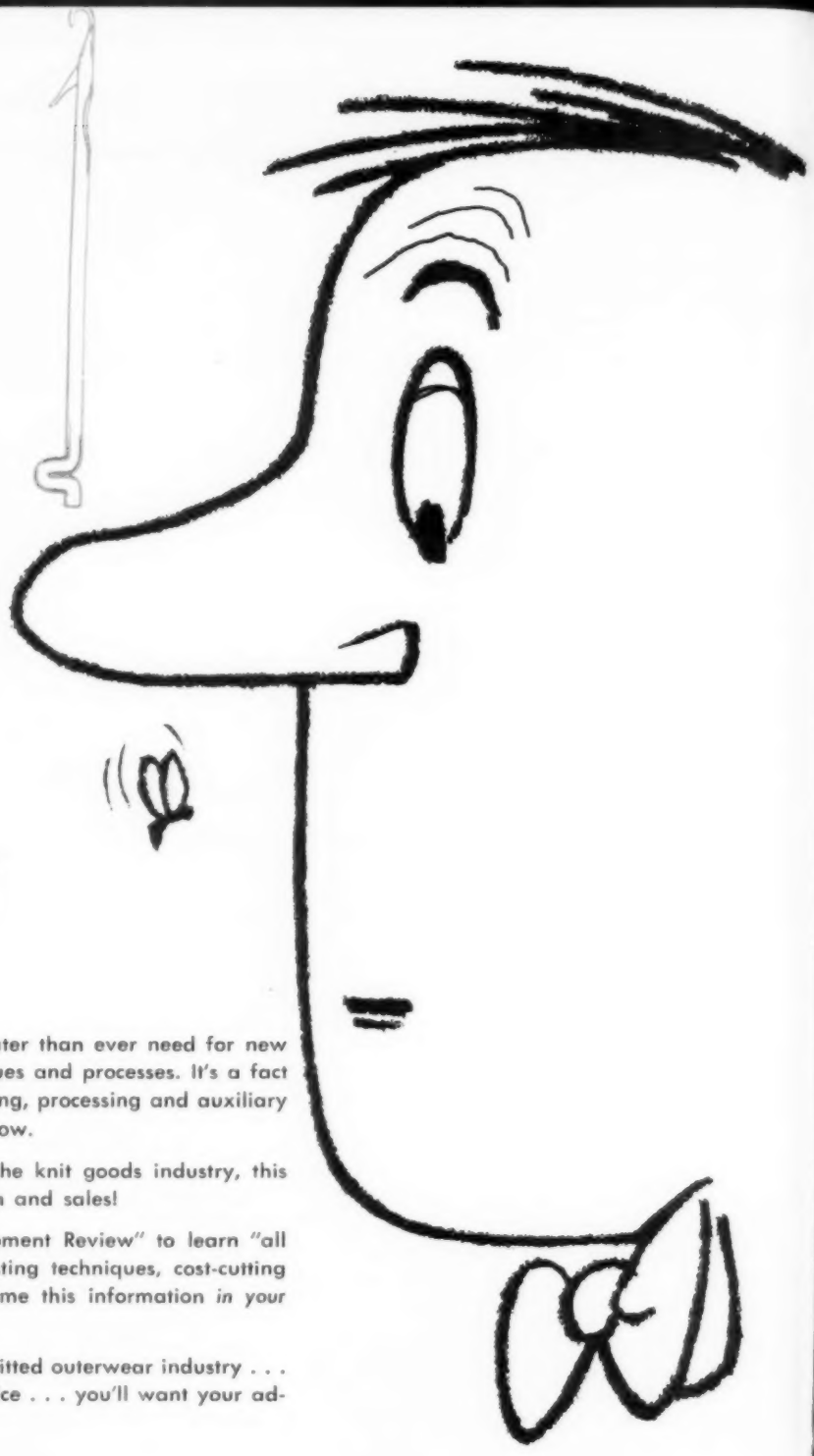

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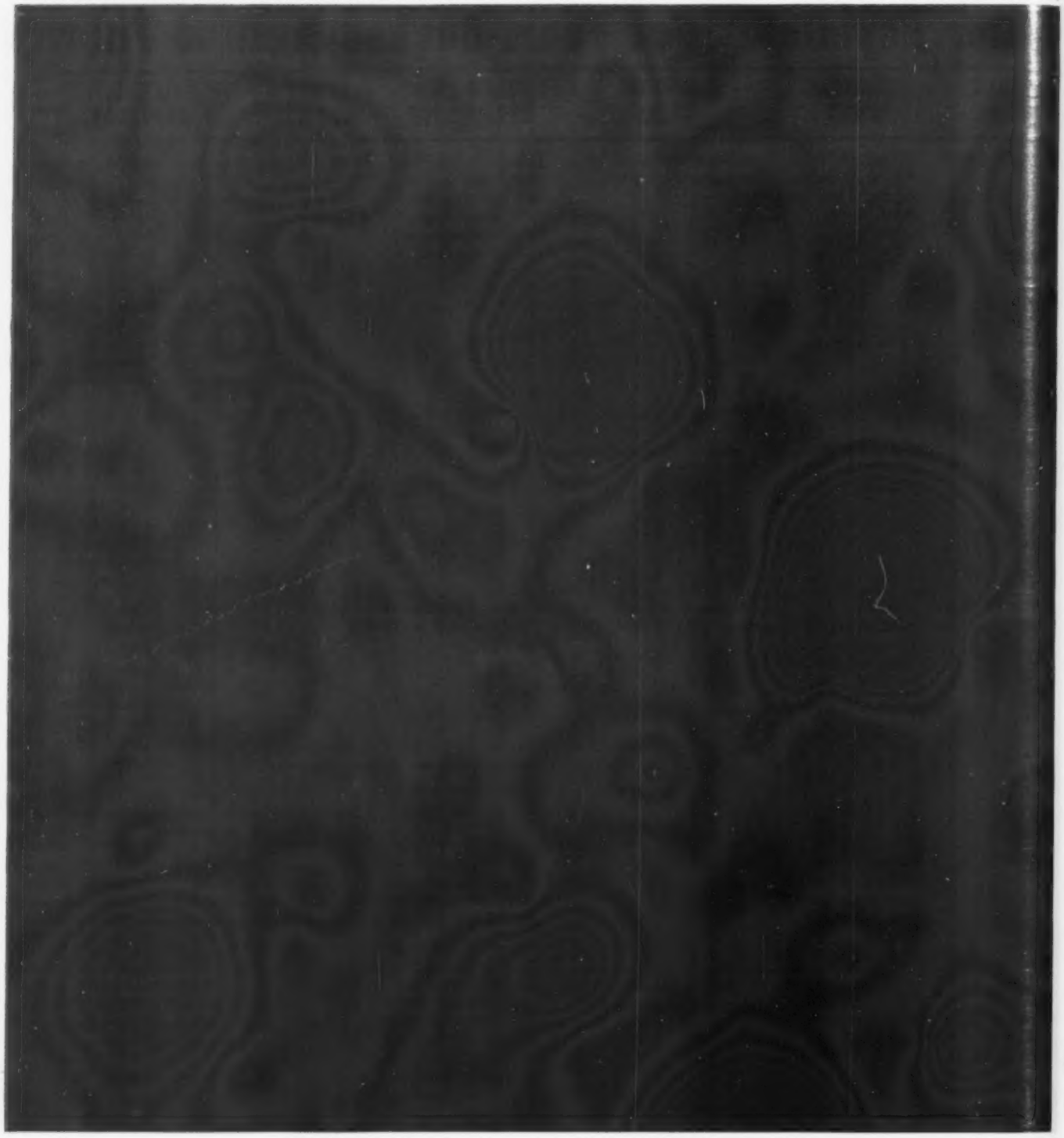
TRADE NAME	MANUFACTURE	CHEMICAL BASIS	FIBER SUBSTANTIVITY	SPRAY RATING	METHOD OF APPLICATION
SCOTCHGARD	Minnesota Mining & Manufacturing Co., St. Paul, Minn.	Nonionic emulsion of a fluorochemical resin.	Can be applied to nearly all natural and synthetic fibers with especially good results on cotton and cotton/synthetic blends.	100%	Standard padding equipment is satisfactory. The product is applied to clean fabric. Drying and curing time are consistent with those used in normal applications of wash and wear resins.
SILADUR CP-180	Arkansas Company, Inc., Newark, N. J.	Durable silicone type in solvent.	All textile fibers.	100%	May be applied before or after depending on type of laminating, fusion or adhesive, 30 to 40% solutions; pad or spray application dependent on drying capacity. Dry only, no curing.
SILOPEL	Scher Brothers, Allwood, Clifton, N. J.	Nonionic silicone dispersion.	Effective on all fibers.	100% with 2% solids pick-up.	Silopel finish consisting of 3 to 5% silopel and 1% Silopel C (the catalyst) is padded onto the laminate at 100 degrees F. Pressure is adjusted to permit 2 to 3% solids pick-up. Laminate is dried and cured at 280 degrees F. for 3 minutes.
SHOWERTEX	Antara Chemicals, A Division of General Aniline & Film Corp., New York City	Emulsion of wax and metal salts.	Cotton, rayon, acetate, wool and blends of these fibers.	90-100%	Padding Method: Use 3% water dispersion at 100-150 degrees F. Dry at 200-250 degrees F. on conventional equipment; no curing or afterwash required. Exhaust Method: Use 3% on weight of fabric at 80-120 degrees F. for 20 minutes in 1:10-1:30 liquor ratio. Bath should be slightly acid. Dry on conventional equipment at 200-250 degrees F.
SYL-MER	Dow Corning Corp., Midland Mich.	Siloxane polymer.	Can be applied to all natural and synthetic fibers, including all fiber blends.	100%	Padding after laminating; 1% to 1½% on weight of goods; padding machine required; continuous application cycle; 2 to 3 minutes curing time at 30 degrees F.
ZELAN AP PASTE DURABLE WATER REPELLENT	E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.	High molecular weight nitrogen compounds.	Cotton, linen, rayon, acetate, nylon and other hydrophobic fibers including Dacron polyester fiber and Orlon acrylic fiber.	100%	Concentration: 2-6%, depending on fiber. Application Stage: After dyeing or during final finishing. Application Procedure: Pad, dry, cure, wash, dry. Equipment: Tube-Tex or similar equipment for padding, drying and curing; reel machine for washing.
ZELAN S DURABLE WATER REPELLENT	E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.	Organic polymer-wax.	All fibers, including natural and synthetic.	100%	Concentration: 3-8%, depending on fiber. Application Stage: After dyeing or during final finishing. Application Procedure: (1) Exhaust bath, dry, cure; or (2) Pad, dry, cure. Equipment: Dye beck for exhaust: Tube-Tex or similar equipment for padding, drying and curing.



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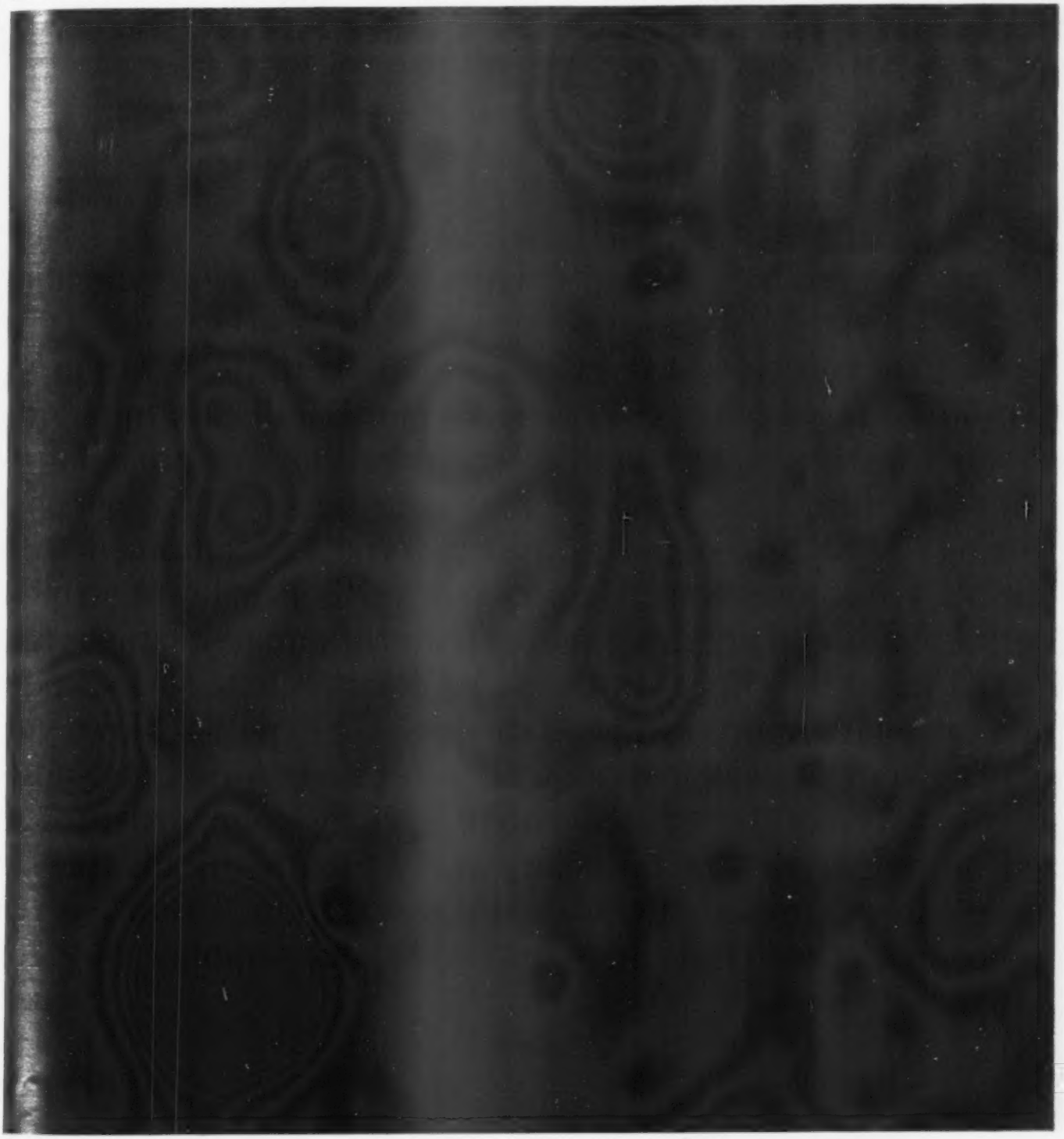

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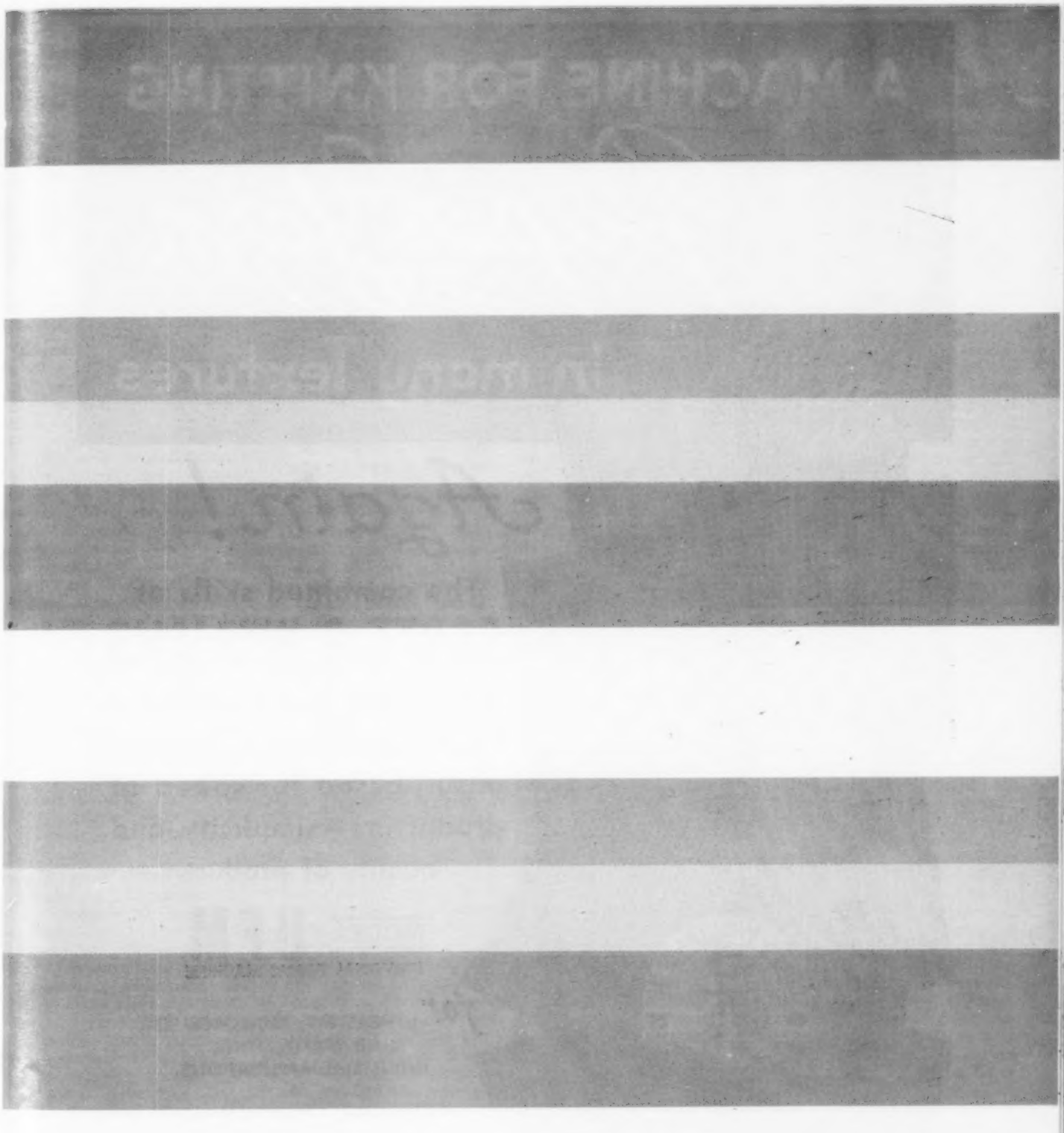

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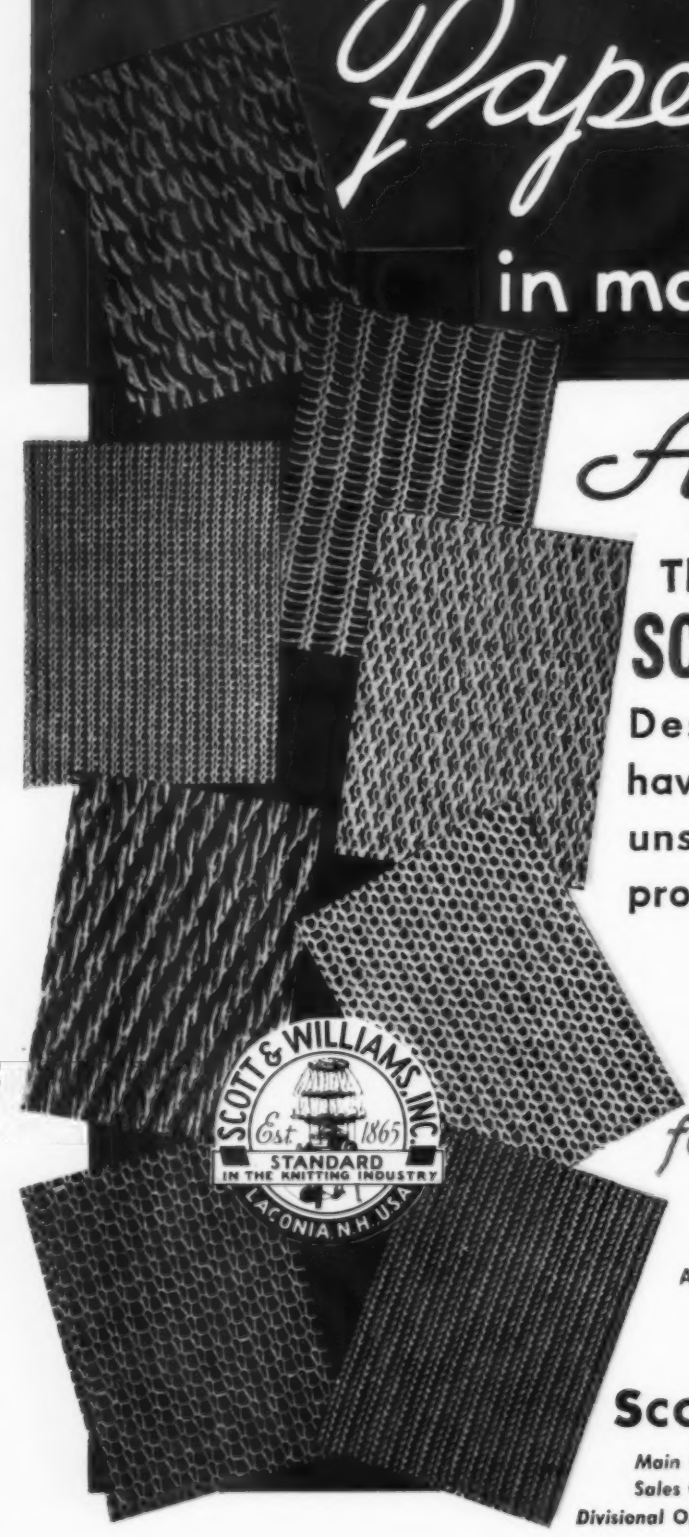

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Dyeing And Wet Processing Review

Recent Developments In Dyeing Orlon Acrylic Fiber

By J. J. IANNARONE, JR.
Technical Laboratory, Organic Chemicals Department
E. I. du Pont de Nemours & Company, Inc.

ALTHOUGH the basic dyeing procedures for Orlon Type 42 acrylic fiber are well established throughout the trade, significant modifications have been made in some areas. In addition, new types of Orlon have been introduced which require special dyeing and handling procedures for optimum results. A summary of some of the more interesting developments regarding the dyeing of different types of Orlon acrylic fiber follows.

Regular Orlon Type 42 Acrylic Fiber—The cationic Sevron dyes are still by far the most widely used dyes for regular Orlon Type 42. These are generally applied at the boil from a slightly acid bath containing sodium sulfate and varying amounts of cationic retarder, depending upon the depth of shade. The retarder performs an important function by regulating the exhaustion of the dye from the bath and thereby promoting levelness throughout the lot. This is especially important in dyeing Orlon with cationic dyes. Once the dyes have exhausted onto the fiber, they do not "transfer" to any great extent, even after prolonged boiling, so that it is necessary to apply the dye levelly in the beginning. In those instances where, because of equipment limitations, it is necessary to dye at the boil, the retarder system is still highly recommended for optimum levelness.

Improved Transfer

Transfer of cationic dyes is vastly improved by increasing the temperature from the boil to about 220°F. while maintaining adequate circulation through the material. Accordingly, in those instances where high temperature equipment is available, levelness can be promoted through the transfer mechanism and the amount of cationic retarder can be reduced or eliminated, depending upon the depth of shade. In fact, the presence of retarder at 225° F. actually inhibits transfer to some degree. The higher temperature and the presence of about 10 per cent sodium sulfate are most effective in promoting transfer and leveling.

This improvement in technology is of little benefit to skein, piece, or garment dyers, since most of their equipment is not suitable for dyeing at elevated temperatures. However, dyeing of both regular and high-bulk Orlon yarn in package form has become increasingly popular and the equipment used in this work is mostly pressurized. Here the transfer mechanism can be used to great advantage.

Package Dyeing

The dyeing of regular Orlon Type 42 acrylic yarn in package form presents little difficulty. On the other hand, high-bulk Orlon shrinks approximately 25 per cent in the dye bath and, therefore, requires special handling techniques to achieve optimum bulk. In the past, most of the high-bulk Orlon was dyed in skein form where the yarn was completely relaxed and was free to "bulk" without restriction. Early attempts to dye high-bulk Orlon yarn in package form resulted in extremely hard packages due to the shrinkage of the yarn, and a lean, flattened and distorted product was obtained. However, package dyeing techniques have been devised which overcome these deficiencies to a large extent. These include dyeing in muff form, or by the Du Pont Sponge Core package dyeing process. In both cases, sufficient resiliency is built into the package so that the yarn is free to shrink to some extent.

In the Du Pont Sponge process, the standard dye tubes are covered with a cellulose sponge sleeve which in turn compensates for shrinkage and bulking of the yarn during the dyeing process. The high-bulk Orlon yarn is wound directly into the sponge covered dye tube without prior preshrinking.

The high-bulk yarn can also be wound into muffs which are then placed directly on the package spindle for dyeing. Because there is relatively little restriction, the yarn is free to "bulk" during the dyeing operation. However, this method requires very careful handling of the yarn before and after dyeing. The muffs must also be packed carefully on the spindle to prevent channeling. Alternatively, the muff can be placed over a rigid dye tube or Davidson Spring with separator plates between each package.

Stress During Backwinding

When coarse count yarns are package dyed, those next to the core may be compressed and somewhat elliptical in cross-section. A procedure which restores the round cross-section and increases the bulk consists of applying stress to the dyed yarn during the backwinding. This is accomplished by passing the yarn over two opposing knife edges set at a predetermined angle. The stress on the yarn breaks the compressed fibers apart so that when the sweaters are hot-tumble dried or steamed, the yarns return to their original length and round cross-section.

Orlon Sayelle Type 21 and Type 24 Bi-Component Acrylic Fibers—The loft and bulk of goods made of Orlon Sayelle Type 21 or Type 24 is produced at random spiral crimping of individual fibers within the yarn bundle. In order to activate the built-in crimping potential of the fibers, the goods must be wet treated at some point for at least 15 minutes at 205°F. Relaxed drying then develops the full crimp.

The dyeing of Orlon Sayelle with cationic dyes differs from that of regular Orlon Type 42 in two important respects: (1) increased dyeing rate with cationic dyes, and (2) much improved dye transfer at 205°F.

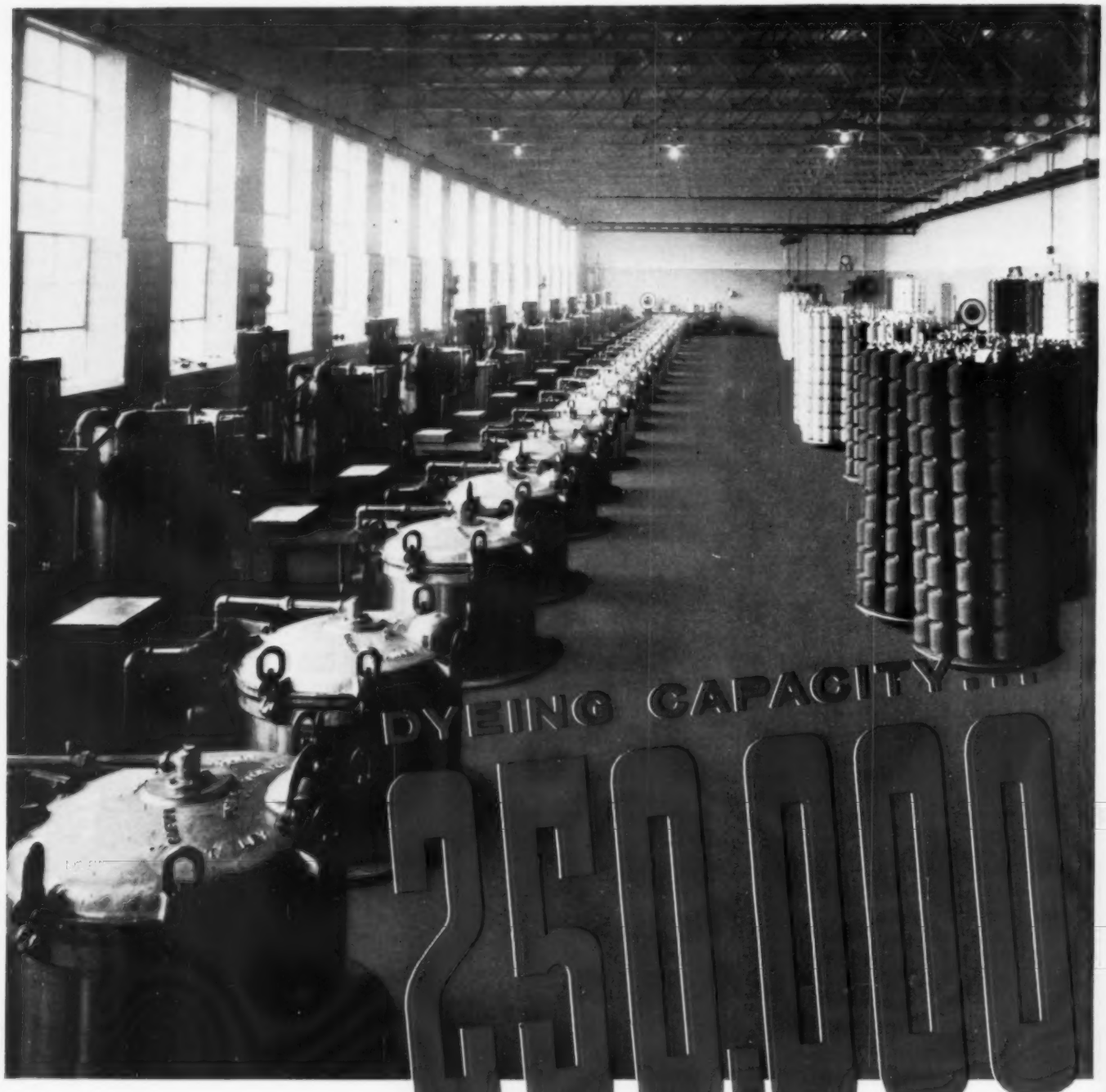
In addition, the use of a cationic retarder inhibits the bulking of goods made of Orlon Sayelle and its use is therefore not recommended. Instead, an anionic retarding system based on Compound No. 8-S (Du Pont) has been developed. In this procedure, the retarding action is accomplished by the formation of a complex between the cationic dye and the anionic agent. The complex is maintained in a finely dispersed condition by the presence of a nonionic agent, Alkanol HCS. During the dyeing operation, the dye complex dissociates and releases the dye to the fiber. Thus, the only cationic material in the fiber is the dye itself.

Bulking Reaction

Since the degree of bulking in Orlon Sayelle is dependent to some extent upon the amount of cationic material in the dyed fiber, it is readily apparent that there will be some difference in bulking between whites or light shades and the deep shades. The difference in bulking potential can be eliminated in most cases by dyeing the medium-to-dark shades at 225°F. whenever possible. In piece dyeing, where it may not be possible to dye at elevated temperatures, the bulking of deep shades can be increased to the level of white or disperse dyed goods by subjecting the garments to a pressure steaming operation for 22 minutes at 228°F.

Orlon Type 44—Unlike Orlon Type 42 or Orlon Sayelle Type 21 and Type 24, Orlon Type 44 is not dyeable with cationic dyes, but it is dyeable with acid dyes. Orlon Type 44 is especially designed for use in combination with Orlon Type 42 for dyeing cross-dye effects in piece form. Blends of Orlon Type 42 and Orlon Type 44, therefore, offer the designer an opportunity for making many interesting patterned fabrics in which either or both fibers can be dyed to contrasting shades. A range of acid dyes which exhibits excellent fastness to light and washing and essentially no staining on Orlon Type 42 is available for Orlon Type 44.

In a summary article, such as this, it is difficult to cover in detail all the changes that have occurred during the past year or so. Detailed bulletins covering the new dyeing procedures and technology discussed above are available upon request from either the Organic Chemicals or Textile Fibers Departments of the Du Pont Company.



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Dyeing And Wet Processing Review

Orlon Type 44—Multicolor Piece Dyeing Of 100% Orlon

By M. BOYNE DAHLEN and ROBERT A. PEARSON
Technical Service Section, Dye Technical Service Laboratory
Textile Fibers Department
E. I. du Pont de Nemours & Company

A WONDERFUL array of piece-dyed multi-color effects in goods of 100 per cent Orlon acrylic fiber has been made possible recently by the development and introduction of Orlon Type 44, newest member of the family of Orlon fibers. It is designed for use in combination with Orlon Type 42 (can also be used with Orlon Types 25, 39, 72, and 75) to produce piece-dyeable heathers, stripes, and patterns with outstanding fastness and brightness of shade. This new fiber development is further augmented by a five yarn system of heathers developed by Du Pont's fabric development section for styling with Orlon Type 44.

The combination of Orlon Type 44 with Orlon Type 42 can be used to produce attractive sweaters, socks, knit piece goods, and woven fabrics. The performance of such garments is similar to that of garments containing 100 per cent Orlon Type 42. The properties of Orlon Type 44 except for dyeability, remain essentially unchanged from those of Orlon Type 42.

Orlon Type 44 is acid dyeable and has no affinity for cationic colors. Orlon Type 42 is dyeable with cationic dyes, but will not accept acid dyes. Therefore, the two fibers in combination can be cross dyed, or one fiber dyed with the other reserved, in one bath with essentially no bleeding or cross staining of dye. The range of coloration can be increased to three colors by the addition of Orlon acrylic fiber color-sealed black.

By styling this fiber combination for piece dyeing, advantages can be realized by the spinner, knitter and dyer in producing multi-color fabrics of 100 per cent Orlon. For the spinner, a reduction in spinning of dyed fiber in his mill should simplify inventory and operating problems. Tints are available for use in preventing yarn mixes in spinning. For the knitter, piece-dye styling can cut the lead time necessary in selecting a color line for many styles, as well as eliminate the maintenance of a dyed yarn inventory for these goods. Knit goods can be stocked in the grey state to be piece dyed against orders. For the dyer, there are advantages in piece dyeing, particularly in being able to cross dye two colors in one bath by a simple, rapid dyeing system.

Color Selection—Since combining Orlon Type 44 with Orlon Type 42 in yarn and knit goods represents a real potential for color styling through piece dyeing, dyes have been carefully selected which will capitalize on this advantage. Acid dyes chosen for the Orlon Type 44 component, and cationic dyes for the Orlon Type 42 component have the following properties:

1. Lightfastness—a minimum 4W rating after 40 hours of exposure in the Fade-Ometer.

2. Washfastness—a minimum 4W rating after subjecting dyed material to a No. 3A AATCC wash test at 140° F.

3. Staining—acid dyes chosen will color only Orlon Type 44 acrylic fiber. Basic dyes color only Orlon Type 42. There is essentially no cross staining or bleeding of color between the two components of this blend.

4. Stability — The cationic and acid dyes selected for this blend have good shade stability under the conditions recommended for dyeing this combination of fibers in a one-bath system.

The following acid dyes meet the foregoing requirements and are recommended for dyeing the Orlon Type 44 component:

Pontacyl Light Yellow GX
Pontacyl Light Yellow 3G
Pontacyl Milling Yellow 5G
Du Pont Milling Orange R
Neutral* Fast Orange G
Du Pont Azo Eosine 2B
Pontacyl Light Red BLX
Du Pont Anthraquinone Blue 2GA
Du Pont Anthraquinone Blue 3G
Du Pont Anthraquinone Blue RA
Du Pont Anthraquinone Blue SWF
Du Pont Anthraquinone Green GNN
Pontacyl Navy Blue M4B

It should be noted that the Pontacyl Navy Blue M4B is recommended for black and navy shades only. The concentration employed should not exceed five per cent (on the weight of the Orlon Type 44 acrylic fiber). Amounts in excess of this may produce unsatisfactory wetfastness properties.

Cationic dyes recommended for dyeing the Orlon Type 42 portion of this blend which give optimum results are:

Sevron Yellow GL
Sevron Yellow R
Sevron Yellow L
Sevron Orange G
Sevron Brilliant Red B
Sevron Brown YL
Sevron Brilliant Red 4G
Sevron Red GL
Sevron Blue NF
Basacryl** Blue GL
Basacryl** Blue 3RL
Maxilon*** Blue RLA
Sevron Charcoal MF
Du Pont Victoria Green small crystals

*Trademark of Geigy Chemical Corporation, Ardsley, N. Y.

Du Pont Victoria Green small crystals should be used in developing black and navy shades. Sevron Charcoal MF should be reserved for light to medium gray shades. Sevron Brilliant Red 2B and Sevron Blue 5G can also be used if lightfastness of 20 to 40 hours is satisfactory for the intended end-use.

The selected dyes listed previously can be applied satisfactorily to combinations of Orlon Type 44 acrylic fiber with Orlon Type 42 at all blend levels. Excellent cross-dyed and reserve effects can be achieved throughout an extensive shade range from pastels to dark

**Trademark of Putnam Chemical Corporation, Beacon, N. Y.
***Trademark of Geigy Chemical Corporation, Ardsley, N. Y.

(*Continued on Page* 49)

TINTS FOR ORLON TYPE 42 AND TYPE 44

Tint	Manufacturer
639 Lemon	Polymer Southern, Inc.
Rinse Free	Greenville, S. C.
630 Rust	Polymer Southern, Inc.
Rinse Free	
Cumol Green	U. S. Testing Company Hoboken, N. J.
Cumol Purple	U. S. Testing Company
Tintout Brown CTW 200	Speedry Chemical Corp.
Tintout Red CTR 300	Speedry Chemical Corp.
Tintout Red CTW 300	Speedry Chemical Corp.
Tintout Blue CTW 400	Speedry Chemical Corp.
Tintout Green CTR 600	Speedry Chemical Corp.
Tintout Green CTW 600	Speedry Chemical Corp.
Tintout Yellow CTR 700	Speedry Chemical Corp.
Tintout Yellow CTW 700	Speedry Chemical Corp.
Tintout Orange CTR 800	Speedry Chemical Corp.

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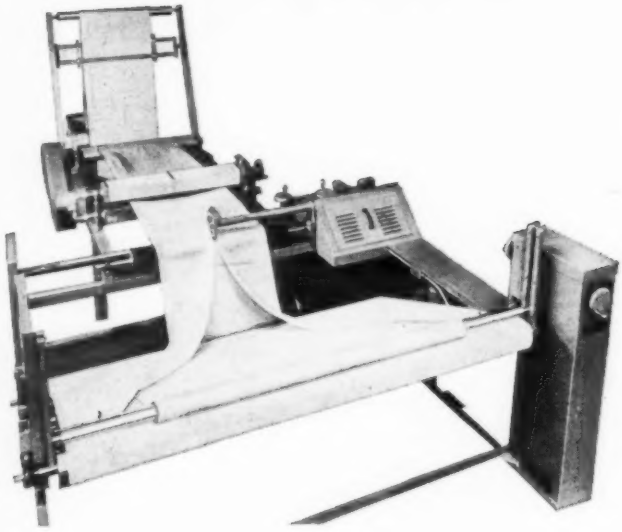

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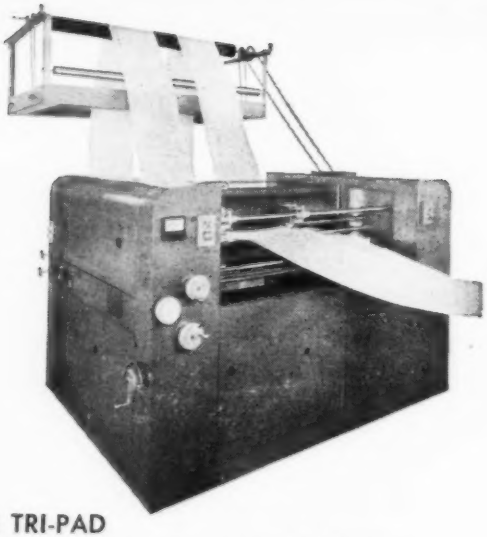

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Dyeing And Wet Processing Review

Piece Dyeing And Finishing Knitwear Of Orlon Sayelle

By CHARLES KERESZTES
Technical Service Section, Textile Fibers Department
E. I. du Pont de Nemours & Company

THERE are now two types of Orlon Sayelle bi-component acrylic fibers on the market. Orlon Sayelle Type 21, the first to be introduced, has been used most successfully in bulky sweaters of many types, knit dresses, and half-hose. Orlon Sayelle Type 24 staple, a recent supplement to the bi-component group of acrylic fibers, is designed for full-fashioned classic type sweaters and flat knit garments. Fabrics knit with this fiber have shown improved resistance to pilling and surface distortion.

During the last few months, an increasing number of knitters have been evaluating the piece-dyeing route for knit goods made of Orlon Sayelle Type 21 and Type 24 bi-component acrylic fibers.

In the past, package dyeing has been the most favored route to manufacture garments of Orlon Sayelle. Package dyeing is economical, it offers unlimited styling possibilities, and knit fabrics made of package dyed Orlon Sayelle show uniform bulking in all shades.

There are several reasons, however, for the new interest in piece dyeing. First, the new piece dyeing and "pressure steaming" techniques — which will be discussed in detail— assure uniform bulk development and level dyeings in all shades. Second, classic type sweaters and flat knit garments made of Orlon Type 42 acrylic fiber are now successfully piece dyed, and manufacturers using Orlon Sayelle Type 24 bi-component acrylic fiber for similar garments are naturally exploring the possibility of piece dyeing. Finally, fabrics of Orlon Sayelle bulk during relaxed drying and not in the dye bath. This unique characteristic of these fibers eliminates any danger of leaning out the fabrics during dyeing.

Experience has shown that the success of piece dyeing Orlon Sayelle fibers depends on the proper handling of the knit goods during dyeing and finishing. The following procedures help to eliminate surface distortion:

1. Turn the goods face inside for dyeing and tumble drying. If necessary, tack the fabrics.

2. Bag fabrics for dyeing in the paddle machine.

3. Run the paddle dyeing machine at the slowest possible speed.

4. Have a good starting formulation to reduce the number of dye additions and to avoid very long dyeing cycles.

5. Extract the goods thoroughly to reduce the tumble drying time.

Piece-dyeing procedures developed for Orlon Sayelle Type 21 and Type 24 are very similar to those used for Orlon Type 42. For bleaching, stripping, and dyeing with disperse (acetate) dyes, the procedures and formulations used for Orlon Type 42 acrylic fiber have been applied successfully to the new bi-component fibers. The chemical and physical differences, however, between Orlon and Orlon Sayelle are more apparent when cationic dyes are used.

1. Cationic dyes exhaust at a faster rate and transfer more freely on Orlon Sayelle.

2. High concentrations of cationic dyeing retarders and/or cationic dyes inhibit the bulking of the piece dyed garments made of Orlon Sayelle fibers. Thus, piece dyed fabrics of Orlon Sayelle Type 21 or Type 24 will bulk slightly more in white and light shades than in dark shades if no special procedures are used.

Consequently, modified piece-dyeing procedures had to be developed to assure level dyeings and uniform bulking in all the shades. The cationic dyeing retarders have been replaced with the Compound No. 8-S anionic dyeing retarder which will not inhibit the bulking of the finished goods and will control the dyeing rate of Sevron dyes.

To assure uniform bulk development through the whole shade range, the dark shade dyed goods have to be pressure steamed after dyeing in an autoclave.

The modified piece-dyeing procedure and the pressure steaming technology are described below:

A. Set the bath at 120° F. with: 1.0% Alkanol HCS surface active agent, 10.0 to 20.0% anhydrous sodium sulfate (20% for light shades), . % cationic dyes, 0.3% sodium acetate, . .% acetic acid (pH 4.5 to 5.0).

B. Raise the temperature to 160° F. at 3° F. per minute.

C. Add slowly Compound No. 8-S if needed.

Light Shades — (up to 3% Sevron dyes) 3% Compound No. 8-S.

Medium Shades — (3% to 5% Sevron dyes) 2% Compound No. 8-S.

Dark Shades — (above 5% Sevron dyes) No Compound No. 8-S.

D. The temperature of the dye bath is raised from 160° F. to 180° F. in 15 minutes and then from 180° F. to 205° F. to 210° F. in 1 hour to assure level dyeing.

E. Dye light shades at least for 45 minutes at 205° F. to 210° F.

Medium and dark shades should be dyed as close to the boil as possible for at least 1½ to 2½ hours even if the dye bath is completely exhausted before this time.

F. Most knitters prefer a dry, crisp hand in garments of Orlon Sayelle bi-component acrylic fiber. To achieve this, dyers use little (0.1% to 0.3%) or no cationic softeners on piece dyed fabrics made of Orlon Sayelle.

G. Extract thoroughly. Tumble dry at 190° F. to 215° F. until dry. Cool slowly to 120° F.

H. Steam knit fabrics or complete sweaters for five to six seconds in an open press to eliminate creases. Vacuum thoroughly. Creases should be eliminated during vacuuming.

The differences in bulking between light and dark shade dyed piece goods can be minimized by dyeing the medium and dark shades as close to the boil as possible, and for a longer time of 1½ to 2½ hours. However, in a number of dark shades the dyed fabrics will reach the bulking level of the white ones only after pressure steaming the dyed goods at 228° F. in an autoclave for about 23 minutes.

In most cases, the dyer, in agreement with the knitter, will have to decide which, if any, shades have to be pressure steamed.

The closer the dyeing temperature is to 212° F. when dyeing medium and dark shades, the smaller the number of shades which will have to be pressure steamed after dyeing.

The number of shades requiring pressure steaming can be further reduced by avoiding the use of excessive amounts of dyes for any given shade. This can be done by starting the shade matching from the light side.

If pressure steaming is needed to increase the bulk of dark shade dyed piece goods, the dyed fabrics have to be steamed in an autoclave. No investment in new equipment is necessary since most of the piece dyers have some type of autoclave or pressure steaming unit for setting textured filament nylon sweaters.

The following general outline of the pressure steaming will help the finisher to work out his own procedures:

A. After dyeing, the knit goods are extracted but not dried.

B. A maximum of eight wet sweaters or sweater bodies and parts are carefully folded on each tray covered with a light cotton fabric. It is not necessary to separate sweater bodies or parts. Place a maximum reading thermometer in the autoclave. Load trays into autoclave.

C. Example of suggested pressure steaming cycle: 30 seconds vacuum; 7 minutes steam —5 pounds gauge pressure (228° F.); 30 seconds lag—0.5 pounds gauge pressure; 16 minutes steam — 5 pounds gauge pressure (228° F.); 2 minutes vacuum; 30 seconds "out." If the bulking of pressure steamed

(*Continued on Page* 35)

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Dyeing And Wet Processing Review

Package Dyed Yarns Of Acrilan For Double Jersey

PACKAGE dyed yarns of Acrilan, Acrilan 16 and Acrilan-Acrilan 16 blends are becoming increasingly popular along with the growth of the double knit field. Yarns dyed by this method will become correspondingly important as double knit production continues to expand.

Except for differences in handling, the same general principles of dyeing outlined in Chemstrand technical bulletins, "Dyeing of Acrilan", and bulletin No. DF-14, "Dyeing of Acrilan 16 and Acrilan 16-Acrilan Acrylic Fiber Blends," apply also to package dyeing.

Insofar as Acrilan is concerned (and the recommendations in this article apply also to Acrilan 16, and Acrilan-Acrilan 16 blends), package dyeing not only gives excellent dye penetration — a particular advantage in heavy shades such as blacks and navies—but also results in shorter dye times, improved washfastness, and savings in steam, dyestuffs, and assistants because of the lower liquor-goods ratio, i.e., approximately 10:1 compared with 20:1 for skein dyeing and 40:1 for piece dyeing.

Recommendations for preparing, dyeing, and handling the yarns are outlined below:

Winding—Quality winding is of vital importance to the success of the package dyeing operation. Unless the packages are wound evenly under correct and uniform tension, or if the packages are of varying size, the dye liquor will flow more easily through some of the packages and through certain parts of individual packages, and the resulting dyeing will be unlevel.

The packages, whether wound on dye springs or dye tubes, should be wound as firmly as possible. When using dye springs, knitted socks should be placed over the springs prior to winding to prevent sloughing as shown in Figure 1. In the case of dye tubes, the yarn can generally be wound directly on the metal, although, with certain type yarns it is sometimes advisable to position a wide rubber band about ½ inch from each end of the tube to prevent sloughing.

Various type machines are being used for package winding yarns of Acrilan. These include the Foster Model 101 Spring Winder, and the Leesona Corporation's No. 44 Roto-Coner equipped with three inch diameter, two turn, six inch uniform traverses.

Loading—When the yarns of Acrilan have been packaged on perforated dye tubes, conventional loading techniques can be used.

When the yarns of Acrilan have been packaged on dye springs, the thermoplastic nature of the fiber at high temperature makes it mandatory for good level dyeings that the package carrier spindles be loaded with up to 20 per cent or more packages per spindle than are normally used when dyeing rayon and the natural fibers. For example, a 50 inch spindle designed for 10 six-inch spring wound packages should be loaded with 12 packages when dyeing Acrilan. This is done to insure uniform package density during dyeing, and to prevent a space from developing between the upper package and the top of the spindle — two factors which would surely cause unlevel dyeing unless the packages on each spindle were compressed almost to their limit during loading.

When dyeing spring wound packages the dyer should also contrive, whenever possible, to load the packages on each spindle to the same height because of the difficulties involved in achieving the same package densities on a fully loaded spindle and a partially "dummied off" spindle.

Besides insuring level dyeing, an additional advantage of the method of loading just described for spring wound packages is that the production dyer is able to increase his machine load—in certain cases by as much as 50 per cent.

Dyeing — Package dyeing yields excellent results with Acrilan providing that several simple rules are followed:

1. Dye liquor should be quite free from suspended matter. To insure this:
   (a) The dyestuffs should be well dissolved (or dispersed if they are insoluble), and should be strained through a sieve of cheesecloth as they are introduced into the expansion tank.
   (b) The water supply must be free from solid impurities or hardness — forming salts which might precipitate the dyes.
   (c) Steam should not be contaminated with boiler water additives.

2. Dry chemicals should be dissolved, and all liquid chemicals should be diluted before adding them to the machine.

3. When large quantities of dyestuff are required, the dyestuff (in solution) should be added at the expansion tank in portions rather than all at once. For example, in the case of a 3.00 per cent basic dyeing an Acrilan 16, assuming a solubility of four ounces per gallon for basic dyes—approximately seventy-two gallons of concentrated dye liquor at 180°F. to 200°F. would need to be added at the expansion tank. To pump or pour this much dye liquor into the machine in one portion would be undesirable. Instead, it should be added over a ten minute period. Smaller amounts of dye (less than three per cent) may, of course, be added over a shorter period of time.

4. To insure against distorted packages, non-uniform packages densities, and unlevel dyeing when the packages have been wound on dye springs—as opposed to dye tubes—take the following precautions:
   (a) Load each spindle beyond its designed capacity (as previously explained).
   (b) Do not open drain and drop bath until yarn is ready to be removed from machine. Employ running rinses to shift from the pre-scouring bath to the dyeing bath to the post scouring bath to the softening bath.
   (c) Do not shut off pump until yarn is ready to be sampled.
   (d) Keep liquor flow from the inside to the outside throughout the dyeing cycle.

When the yarns have been wound on dyed tubes, as opposed to dye springs, dyeing is

(*Continued on Page* 47)

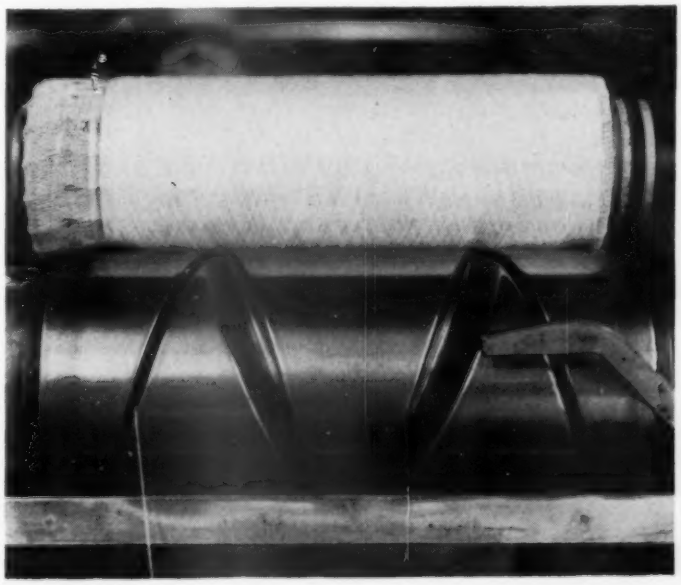

Figure 1—Yarn of Acrilan 16 shown being wound onto spring over knitted sock.

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Dyeing And Wet Processing Review

Finishing Tubular Fabrics Knitted Of Creslan Fiber Yarns

By BERTRAM STERNLIEB
Technical Service Department
American Cyanamid Company

FABRICS knitted from yarns of Creslan acrylic fiber, like any other tubular knit cloths, are finished in order to: (1) Remove foreign matter such as coning waxes, spinning and knitting oils and other impurities from the fabric; (2) relax the yarn in the stitch formation; (3) enhance aesthetically the character of the fabric, and ultimately the end product, by the application of appropriate chemicals; (4) achieve uniform fabric width by steaming.

Tubular knits may range from lightweight jerseys through medium-weight cloths in flat and novelty stitches, to such heavier constructions as double knits and swimwear fabrics containing elastic yarns. Fabric construction must be taken into account in finishing, and for this reason the recommendations made in this article are general and broad in scope.

The procedure set forth below is applicable to both yarn-dyed and piece-dyed fabrics made from Creslan acrylic fiber.

Preparation — Fabrics knitted on some machines or in certain constructions come out of the machine with the face, or right side of the cloth, on the inside. Tubular knitted fabrics made from Creslan should be turned face out before proceeding with finishing operations.

If adjustable, the overhead reel on the dye box should be positioned fairly close to the box, yet high enough to pull the fabric up without tangling it.

The water level in the box should be high enough to cover the fabric during processing. This will give the cloth the full advantage of the bath, while reducing the "drag" on it as it is drawn out of the water and taken up on the reel.

Wetting Out—In selecting a machine (dye box) of suitable size to accommodate the number of fabric pieces to be finished, it must be remembered that abnormal deviations in goods-to-liquor ratio will alter the effectiveness of the finishing procedure.

1. Scouring:

(a) Fill the machine with water and raise the temperature to 100° F.

(b) Load the fabric, start the machine and check that the water level is high enough to cover the cloth.

(c) Slowly raise water temperature to 130° F.

(d) While the temperature is rising, add 1% to 2% (by weight of fabric) Triton X-100, (Rohm & Haas Co., Philadelphia, Pa.) Deceresol NI (American Cyanamid Co., Bound Brook, N. J.) or any comparable nonionic detergent. Run for twenty minutes. The percentage of detergent will depend on the yarn spinning route and the fabric construction.

2. Rinsing:

Drain the detergent bath and refill with fresh water. While the machine is running and the goods are in motion, rinse thoroughly by overflowing. Water temperature should be 90° to 110° F.

Maintain a pH of 6.0 to 6.5 during the rinse. If the reading is lower, slowly add small quantities of tetrasodium pyrophosphate (TSPP) or soda ash until the desired pH is obtained.

3. Applying Softener:

When all the detergent suds have been removed, drop the

(*Continued on Page* 27)

WETTING OUT—Fabrics knitted from Creslan yarns are scoured with nonionic detergent in a dye box at United Dyeing and Finishing Co.

WET PROCESSING—Creslan acrylic fabrics come out of dye box at Cornet Piece Dye Works after scouring and the application of a softener.

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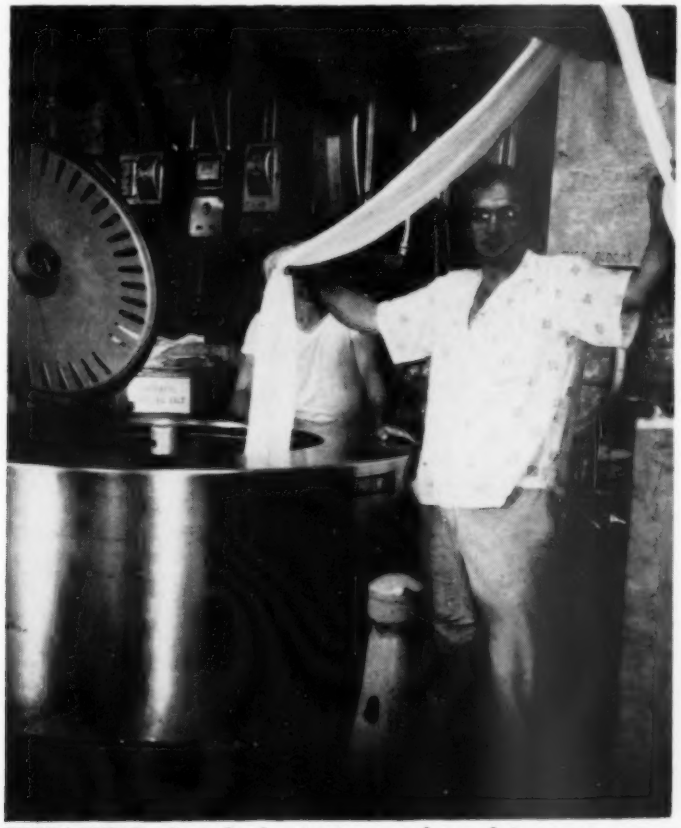
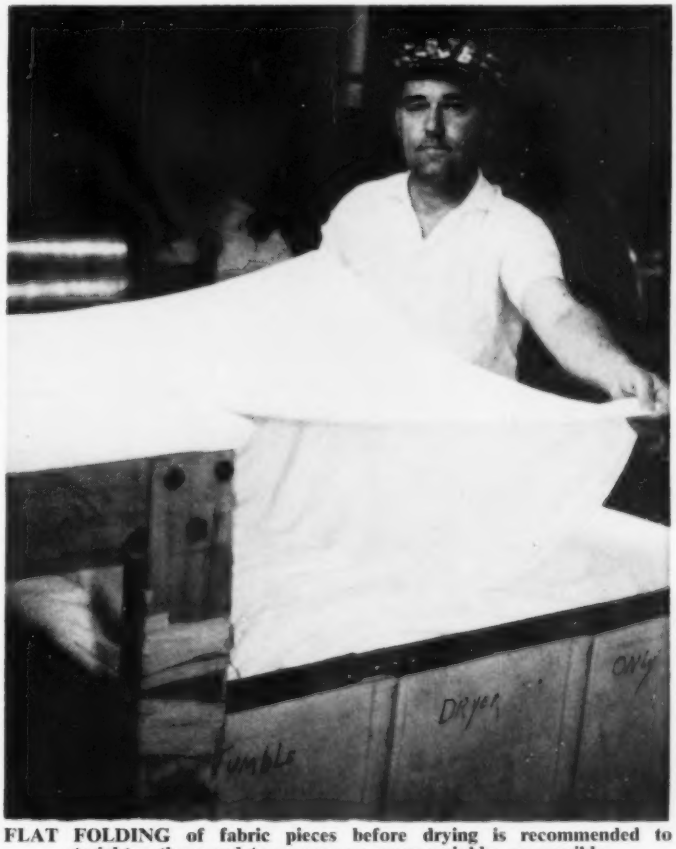


EXTRACTING—Centrufugal extractor may be used to remove excess water from tubular knits made from Creslan® acrylic fiber.



FLAT FOLDING of fabric pieces before drying is recommended to straighten them and to remove as many wrinkles as possible.

bath, refill with fresh water and slowly raise temperature to 120° F. Once again the water level should be high enough to cover the fabric in the box.

Add 0.5% to 2% (by weight of fabric) Sapamine WL, (Ciba Co., Inc., New York, N. Y.) Velvetol AF, (Quaker Chemical Co., Conshohocken, Pa.) or any comparable cationic softener, and run the machine for fifteen to twenty minutes. The per cent softener employed will depend on the construction of the fabric and the customer's requirements. Do not rinse after applying softening agent.

Remove fabrics from the machine before dropping the softener bath.

Extracting — The most common method of removing excess water from fabrics is via a centrifugal extractor. Fabrics should be loaded into the extractor drum so as to allow for even weight distribution. Only a short extraction time is required. Once the large volume of water has ceased flowing from the extractor drain, the machine may be turned off and stopped. The fabric should then be removed from the extractor and flat-folded in preparation for drying.

Another method of removing water from tubular-knit fabrics made from Creslan acrylic fiber is to pass the cloth over a spreader and between a pair of rubber-covered squeeze rolls. If the pressure on the rolls is not excessive and if fabric texture permits, satisfactory results will be achieved. The spreader frame should be set just wide enough to remove all wrinkles and fold marks from the wet fabric.

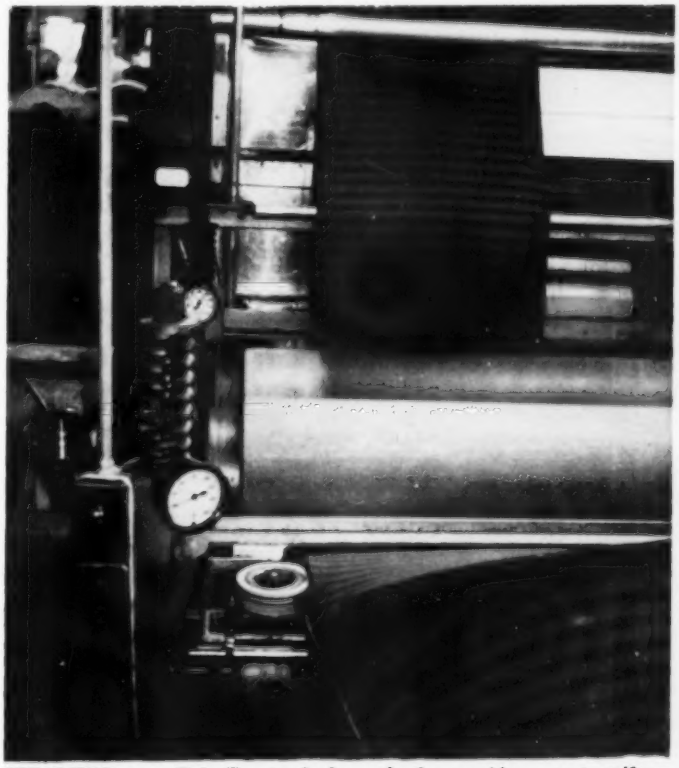
In no event should the fabric be permitted to remain damp overnight.

Drying—Optimum results are obtained when extraction is followed by drying as soon as reasonably possible; in any case, before natural evaporation takes place.

If a drum-type dryer such as the Tube-Tex Reelax-Jet is employed, adjustments can be made in the speed of the fabric-conveying drums, the temperature and the speed of the overfeed mechanism.

In single machine or tandem

(*Continued on Page* 29)



STEAMING on a Tube-Tex tensionless calender provides a neat, uniform roll of fabric. Very little steam is required in finishing Creslan acrylic fiber.

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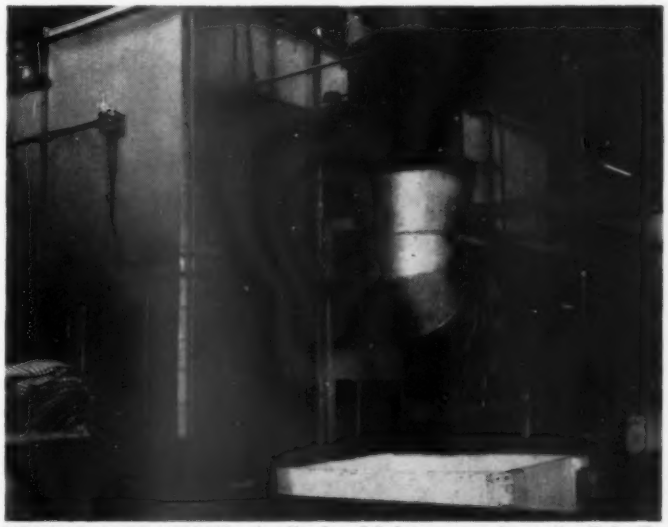
arrangement, the temperature should be adjusted to 180° F. A drying speed of five yards per minute, with a 10 per cent overfeed, is recommended. Although it is usually not necessary to vary the temperature, the speed of the machine and the rate of overfeed may be altered — again depending on fabric construction and weight. Heavier, tighter constructions require less overfeed and longer drying time.

If a loop-type dryer is used, care should be taken to allow the fabric to enter the machine with as little tension or drag as possible. Flat-folded fabrics are recommended for the proper feeding of the loop-type dryer.

A drying temperature of 180° F. is recommended. The machine speed will depend on the condition of the fabric as it comes out of the machine. If damp or not thoroughly dry, slow down the machine speed until the fabric comes out dry.

Steaming — Excellent results have been achieved with a Tube-Tex tensionless calender.



DRYING OPERATIONS—As Creslan fabrics emerge from the Tube-Tex Reelax Jet dryer they are automatically folded and made ready for steaming.

Tubular knitted fabrics made from Creslan acrylic fiber require very little steam to bring them out to normal width and to remove wrinkles. Consequently, the steam valve should be turned down to allow a minimum amount of steam to penetrate the fabric as it passes over the spreader.

Care should be exercised in operating the machine to see that "bows" in the fabric are removed and also that there is no tension on the fabric between the spreader frame and the roll-up apron.

Felt-covered rolls are recommended, and they should be adjusted to a "no pressure" setting.

As the diameter of the finished roll increases on the machine, the overfeeding mechanism should be adjusted so that there is uniform tension and density throughout the roll and so that the sides of the roll are neat and even.

The width of the fabric being rolled up should also be checked periodically to insure that the spreader is at its proper setting.

It is recommended that careful and exact processing records be kept on new samples of tubular-knitted fabric made from Creslan acrylic fiber. Such records will be useful to the finishing plant in making adjustments or improvements in technique on subsequent shipments, in line with the customer's requirements.

Dyeing And Wet Processing Review

Dyeing New Zefran 1207 Fiber Alone And In Blends With Wool

ZEFRAN 1207 acrylic, Dow Chemcial Company's new, more dyeable acrylic fiber currently is being used in knitwear, principally as 100 per cent or in combination with wool. Types 1203 and 1207 Zefran acrylic may be dyed with the same dyestuff classes; however, deeper and brighter shades are obtained on Type 1207 from a wider selection of dyes at lower costs.

Neutral premetallized, acid, and direct dyestuffs are recommended for skein and piece dyeing Zefran 1207 acrylic. These dye classes along with sulfurs, vats, and naphthols are used for package dyeing. Dyestuffs are applied by conventional methods and on equipment common to most dye houses.

Blends of Zefran 1207 acrylic and wool may be yarn or piece dyed with the same formulas.

Following are formulas for kettle dyeing women's wear knit fabric of 75% Zefran 1207 acrylic fiber and 25% wool worsted (not carbonized). The same formulas can be used for package dyeing and skein dyeing.

Procedure:

Set Bath: 1% Non-ionic Leveling Agen, 5% Ammonium Sulfate, 20% Glauber's Salt, pH 6.5

Run cold for 10 minutes. Add dyestuff. Heat to boil over 30 minutes. Run at boil for one hour. Rinse and dry.

Formulas:

SCARLET
0.15% C. I. Acid Red 143.
2.50% Polar Red GRS.
0.40% C. I. Direct Red 39.
40% Glauber's Salt.

FLEMISH BLUE
0.15% Surpalan Blue B3G.
0.02% C.I. Acid Red 211—Neutral Premetallized.
0.10% C. I. Alizarine Supra Sky RW.
0.20% C. I. Acid Blue 80.
0.01% Irgalan Yellow FGL.
0.007% C. I. Acid Red 143.

BLACK
4.0% C. I. Direct Black 38.

INDIAN ORANGE
0.48% C. I. Acid Orange 88 —Neutral Premetallized.
0.42% C. I. Acid Yellow 116 —Neutral Premetallized.
0.33% C. I. Acid Red 143.
0.84% Irgalan Yellow FGL.

POPCORN YELLOW
0.2% C. I. Acid Yellow 116 —Neutral Premetallized.
0.003% Capracyl Olive Green B.
0.001% C.I. Acid Brown 47 —Neutral Premetallized.
0.014% C. I. Acid Red 143.
0.002% C. I. Acid Blue 80.
0.400% Irgalan Yellow FGL.

GOLD
0.800% C. I. Acid Yellow 116 —Neutral Premetallized.
0.045% Capracyl Olive Green B.
0.066% C. I. Acid Brown 47 —Neutral Premetallized.
0.080% C. I. Acid Red 143.
0.040% C. I. Acid Blue 80.
1.000% Irgalan Yellow FGL.

GOLD BROWN
1.000% C.I. Acid Yellow 116 —Neutral Premetallized.
0.008% Capracyl Olive Green B.
0.480% C. I. Acid Brown 47 —Neutral Premetallized.
0.300% C. I. Acid Red 143.
0.055% C. I. Acid Blue 80.
9.880% Irgalan Yellow FGL.

LICHE
0.5% Supralan Blue B3G.
3.5% Pyrazol Fast Turquoise FBL.
2.1% Irganol Brilliant Yellow 3GLS.
0.75% C. I. Acid Blue 7.

ALMOND GREEN
0.10% Capracyl Green 2Y.
0.12% C. I. Acid Yellow 116 —Neural Premetallized.
0.09% Capracyl Olive Green B.
0.03% C. I. Acid Red 143.
0.12% C. I. Acid Blue 80.
0.20% Irgalan Yellow FGL.

Selected milling or acid colors on wool and neutral premetallized and/or direct colors on Zefran 1207 acrylic have produced level dyeings with good shade control of the blend in both yarn and fabric form. In some cases the wool also can be dyed to the desired shade with the neutral premetallized dyes. An illustration of this would be a red shade dye with C. I. Acid Red 178 (neutral premetallized dye).

(*Continued on Page* 31)

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Brightness not obtainable with direct or neutral premetallized dyes may be obtained by using selected acid colors for both wool and Zefran 1207 acrylic. Bright royals and pastel blues may be dyed with Alizarine Supra Sky RW applied to both fibers. Bright yellows may be dyed with Irganol Brilliant Yellow 3GLS applied to both fibers.

A one-bath, one-step procedure is recommended for dyeing blends of Zefran 1207 acrylic fiber and wool. Knit fabric or yarn is scoured at 160°F. to 180°F. with a non-ionic detergent and pH is adjusted to 6.5 before dyeing. The dyebath is set at 80°F. to 90°F., then the dyes for both fibers are added. Dyebath temperature is raised to a boil over 45 minutes and the material boiled for 30 minutes before sampling. If shade corrections are necessary, colors for Zefran and/or wool colors can be added at 160°F. to 180°F. depending on dyestuffs used. The dyebath is boiled for an additional 30 minutes. Knit fabrics composed of Zefran 1207 acrylic fiber and wool should be cooled to 160° F. by radiation before rinsing. After rinsing, a softener can be applied at 110°F. to 120°F. for desired finish. Most cationic softeners used on blends of acrylic fiber and wool are suitable for Zefran 1207 acrylic and wool; however, these materials should be evaluated on Zefran acrylic and wool blends prior to use in order to determine their suitability.

Typical dyebath auxiliaries include 1.0 per cent non-ionic leveling agent, 5.0 per cent ammonium sulfate (pH 6.5) and 10 to 20 per cent Glauber's salt. Leveling agent and Glauber's salt can be omitted in the very heavy shades. Dyebath auxiliaries help produce level dyeings, and also affect the union.

Leveling agents and Glauber's salt retard the dyeing of wool more than the dyeing of Zefran 1207 acrylic in these blends, especially when using neutral premetallized dyes. The lower pH tends to retard milling dyes on Zefran acrylic, but does not retard neutral premetallized dyestuffs when Glauber's salt is in the dyebath. Neutral premetallized dyes can be used to dye both fibers in medium to heavy shades by eliminating the Glauber's salt and lowering the pH to 4.5-5.5.

Colors recommended for the wool portion of the blend follow:

C. I. Acid Red 143.
C. I. Acid Blue 80.
Irgalan Yellow FGL (Dyes wool similar to milling dye).

Wool color for shades that require more brilliance follow:

C. I. Acid Blue 7.
C. I. Acid Green 16.
C. I. Acid Red 145.
C. I. Acid Red 122.
C. I. Acid Red 138.

Colors for Zefran 1207 acrylic fiber are not as limited since most of the neutral premetallized dyes are applicable and result in good fastness with only a light stain on the wool when dyed with Glauber's salt. Cibalan Bordeaux EL, C. I. Acid Orange 88—neutral premetallized. C. I. Acid Yellow 116—neutral premetallized and Irgalan Navy Blue 5RL are some of the most economical neutral premetallized dyes for Zefran acrylic.

Direct dyes recommended for Zefran 1207 acrylic fiber follow:

C. I. Direct Black 38.
C. I. Direct Red 39.
C. I. Direct Yellow 50.
C. I. Direct Brown 95.
C. I. Direct Violet 48.
Pyrazol Fast Turquoise FBL.

Direct colors, along with some acid dyes, are the most economical as well as produce the brightest shades for blends of Zefran 1207 acrylic and wool. Special coolrs recommended for Zefran acrylic follow:

Irganol Orange GRLS.
Nylofast Dark Brown N.

Colors that dye both Zefran acrylic and wool follow:

C. I. Acid Blue 113.
C. I. Acid Red 85.
C. I. Acid Orange 47.
Irganol Brilliant Yellow 3GLS.
Polar Red GRS.
Alizarine Supra Sky RW.
Irgalan Brilliant Green 3GL.

The following gives relative build-up of color on Zefran 1207 acrylic fiber and wool dyed together using procedures from Table 1 and 2 0 per cent dye on weight of both fibers in 50/50 blend.

Erional NW is recommended as a reserving agent on Zefran for some acid and milling dyes. For example, the relative depth of Acid Blue 80 on Zefran 1207 and wool can be altered from approximately 30/70 to 0/100 using Erional NW. Thus, wool dyed Zefran reserved effects can be obtained using this principle.

Dyestuffs	Zefran 1207	Wool
Capracyl Olive Green B	90	10
C. I. Acid Orange 88—Neutral Premetallized	90	10
C. I. Acid Yellow 116—Neutral Premetallized	90	10
Pyrazol Fast Turquoise FBL	80	20
C. I. Direct Red 39	80	20
C. I. Direct Black 38	60	40
Alizarine Supra Sky RW	50	50
Irganol Brilliant Yellow 3GLS	45	55
C. I. Acid Blue 113	40	60
C. I. Acid Red 85	50	50
C. I. Acid Blue 80	20	80
C. I. Acid Red 143	20	80
C. I. Acid Violet 48	20	80
Irgalan Yellow FGL	40	60
C. I. Acid Green 16	10	90
C. I. Acid Blue 7	5	95

Knitting yarn may be made from stock dyed Zefran and wool. Sulfur dyes are recommended for heavy shades on Zefran while vat and naphthol dyes are recommended for fast, bright shades.

Yarn containing Zefran and wool can be dyed extremely fast shades with soluble vats. Soluble vats on Zefran fiber and wool are fast to carbonizing, fulling, washing and sunlight. Due to increased dyeability of Zefran 1207, full shades can be dyed with as little as two per cent dye.

Blends of Zefran 1207 and wool may be package dyed with soluble vats by procedures similar to those used when dyeing with neutral premetallized and milling dyestuffs. Lower pH and high temperature increase shade build-up on the wool. Union shades are usually dyed at the boil with a pH of 6.5 to 7.5. Soluble vats on blends of Zefran and wool are developed using recommended wool procedures. Indigoid types tend to dye the wool heavier while anthraquinone types build better on Zefran 1207.

Formulas illustrating procedures for package dyeing yarn containing 55% Zefran 1207 acrylic fiber and 45% wool with soluble vats follow:

ROYAL BLUE

Scour: 1.0% Non-ionic Detergent at 180° F. for 20 minutes.

Rinse.

Set Bath: 1.0% Sodium Sulfoxylate Formaldehyde, 50.0% Glauber's Salt, 0.5% Sodium Hexametaphosphate, pH 7, cold, 10 minutes. .

Add: 2.0% C. I. Solubilised Vat Blue 5, 2.0% C. I. Solubilised Vat Blue 6.

Heat to boil for 30 minutes.

Rinse.

Develop: 10 Grams/Liter Sulfuric Acid, 3.0% Ammonium Thiocyanate, 2.0% Sodium Bichromate.

Cold to 190° F. run at 190°F for 30 minutes.

Rinse.

Neutralize 2 Grams per Liter Soda Ash Cold.

Rinse.

Soap using 1.0% Non-ionic Detergent at 200° F. for 10 minutes.

CERISE

Scour: 1.0% Non-ionic Detergent at 180° F. for 20 minutes.

Rinse.

Set Bath: 1.0% Sodium Sulfoxylate formaldehyde at pH 7.5.

Add: 1.5% Solubilised Vat Violet 3.

Heat to 185°F.

Add 25.0% Glauber's Salt, over 45 minutes at 185°F.

Rinse.

Develop: 10 Grams/Liter Sulfuric Acid, 2.0% Ammonium Thiocyanate, 2.0% Sodium Bichromate.

Cold to 190°F., run at 190° F. for 30 minutes.

Rinse.

Neutralize: 2 Grams/Liter Soda Ash, Cold.

Rinse.

Soap using 1.0% Non-ionic Detergent at 200°F. for 10 minutes.

Rinse.

is the name for Morgan

Dyeing And Wet Processing Review

Factors Affecting Production Of Washable Wool Knitwear

By DR. JOHN McPHEE
Australian Scientific Liaison Office

MANY processes have been proposed to overcome the tendency of wool fabrics to shrink during laundering. This shrinkage, known as felting, is due to fiber movements and entanglements resulting from forces applied in laundering. Relatively few processes have reached any industrial significance and, even now, only a small proportion of wool fabrics is treated. It is interesting to consider possible reasons for this, as, at first sight, the production of treated wool garments which can be washed more easily and for much longer than untreated garments, should be of great benefit.

All the processes are basically capable of giving a high degree of shrink-resistance to wool, with reasonably low direct chemical and labor costs. Problems of yellowing, harsh handle and difficulty of dyeing afterwards are met to a greater or lesser extent with most but not with a new process developed in Australia which involves treatment of wool with potassium permanganate in a saturated brine solution.

A further advantage of this method is extreme chemical simplicity. No analysis of unstable reagents are required and the process needs no analytical control in the mill. The amount of permanganate required on given fabrics is established by initial trials, and usually is in the range three to five per cent on the weight of fool. The method of treatment is to run the wool in a conventional dyeing machine containing a saturated salt solution, and to add the permanganate, which has previously been dissolved in the minimum amount of water. The reaction is over when the pink color of permanganate has disappeared from the solution. A second, short treatment with bisulphite is then carried out to remove a deposit of manganese dioxide from the goods. This manganese dioxide is formed as a by-product of the reaction of permanganate with wool.

Such simplicity of control is welcome when the factors which affect the rates of shrinkproofing reactions are considered. These are fiber type, fabric structure, type of machine used (which determines the degree of agitation or rate of flow of liquor through the wool), the conditions used for dyeing if the wool has been dyed, the presence of oils and impurities on the wool, the wetting agent used in the liquor, the liquor to goods ratio, the temperature and pH of the liquor. Many, but not all, of these variables can be kept constant in particular applications. It can be seen, therefore, that use of a "standard" set of conditions of reagent concentration, time, temperature and pH for a shrinkproofing treatment can lead to inconsistent results being obtained with different batches if analyses are not carried out on the shrinkproofing liquor in the actual treating machine. With the new process, the estimate of completion of reaction is visual and all features can be easily controlled. Complete details of industrial application of the process are freely available and can be obtained from the Division of Textile Industry, C.S.I.R.O., P.O. Box 21, Belmont, Geelong, Victoria, Australia, or from The Wool Bureau Inc., 360 Lexington Avenue, New York 17, N. Y.

As well as the chemical treatments themselves, which will vary effectively control felting shrinkage, we have to consider relaxation shrinkage. This is a shrinkage which occurs simply on wetting out and is due to release of tensions applied to yarns in knitting or to garments in pressing. Garments cut from fabric taken straight from knitting machines or garments pressed while held stretched to a given size, will shrink to their true, stable, relaxed dimensions on wetting. This meant that, in an extreme case, a garment can be unsatisfactory after one gentle wash, even though it may have been given an effective chemical treatment which would prevent any further shrinkage in future launderings.

Another feature of pressing which should be avoided if possible, is that of pressing to an unstable shape. Thus, even although a garment has been made from a shrinkproofed, fully relaxed fabric, if it is shaped on the press by stretching in one direction only, on subsequent wetting it will return to its original shape, again perhaps becoming unacceptable after the first mild wash. Best results are obtained, therefore, if garments are knitted as closely as possible to the required final dimensions or cut from fully relaxed fabric so that only a minimum of shaping will be required in the final pressing.

Here then we find one reason why knitwear, adequately treated during manufacture to overcome felting shrinkage, may not be acceptable to consumers. If the garments still have a large amount of relaxation shrinkage, unsatisfactory performance can result. A consumer does not, and should not be required to distinguish between these two types of shrinkage and both should be at a minimum when a garment is sold as shrink-resistant.

The ideal way to produce shrink-resistant garments is to treat chemically the final knitted fabrics. After the treatment, the knitted fabric is dried without tension, i.e. by tumble drying garment bodies or by using suitable tensionless dryers for long lengths.

However, it is not always possible or desirable to carry out this sequence, especially with fancy knits. Here, knitting can be done with yarn already shrink-proofed. This is obtained by chemically treating loose wool, silver, top or the yarn itself. The wool is treated with the same chemical processes, in the dyeing machines used commonly at the chosen stage of processing, as are used on finished fabrics. The least satisfactory machine is the open-can dyeing machine used for tops, where moderately uneven treatment, at least, is usually obtained. This means that maximum shrink-resistance for a given amount of chemical reagent is not obtained. It is better to treat tops in pressure dyeing machines, where the flow of liquor relative to wool is generally for better, or the tops can be treated continuously by unwinding and passing through the chemical reagent in one or two extra bowls in front of a conventional backwash. After knitting, a final relaxation procedure can be carried out to ensure that garments will not shrink to too great an extent when first wet out. A final, thorough steaming often brings the fabric sufficiently close to its stable, relaxed dimensions.

Laundering procedures have a fundamental bearing on the performance of treated wool knits. Many knitted fabrics, e.g. relatively tight plain knits (stitch length 0.45—0.55 cm.) or double knits, will felt relatively slowly. With an adequate chemical treatment, such knitted garments will perform excellently in general home washing machines. On the other hand, many loose knits are very susceptible to shrinkage during laundering, e.g. loose plain knits (stitch length 0.8-0.9 cm.) or fancy bulky knits. The performance of these in machine washing can be greatly enhanced by chemical treatment, certainly to a sufficient extent that these garments can be washed in short, gentle cycles on modern home washing machines. However, these treated garments have a limited life in severe launderings, such as in the rotary machines used in many commercial laundries. The difficulty which arises is that, if the loosely constructed garments are treated with high concentrations of reagents in order to prevent felting shrinkage in very severe laundering, then stretching can occur in short or gentle washes, and the garment may then be unsatisfactory for these more normal home laundering procedures.

"Fully-automatic home washing" has come to mean washing and tumble drying in a hot air rotary dryer. Most knit structures will shrink due to a con-

(*Continued on Page* 45)

Color is the name for Morgan

Ancient Egyptian embalmers wrapping mummy in final indigo-dyed linen.

2,000 POUND DYE LOTS

These two huge tanks in the Morgan Package Dyeing Department — the latest advance in package dyeing technology — can operate together to produce 2,000 pounds of beautifully, identically dyed worsted or synthetic yarns . . . or singly, can produce 1,000 pound lots at peak efficiency.

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Skein dyeing • Package dyeing • Raw stock dyeing • Top dyeing • Tow dyeing

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ABOUT THE ILLUSTRATION ON THE OTHER SIDE OF THIS INSERT:

Reference material courtesy of Ciba Company Inc.

Painting by Claude L. Salisbury

HOW THEY DID IT IN ANCIENT EGYPT

Relics of fabrics found in the tombs of ancient Egypt show the people of that age to have been expert in the use of indigo and madder for dye purposes. Here, the artist shows a step-by-step portrayal of the probable process. In the background, in a manner suggesting the wall painting so popular at the time, are the representative steps — beginning (at upper left) with the harvesting of the indigo plant beneath the Egyptian sun, and its subsequent fermentation in the clay urns. Meanwhile, the flax is beaten and the thread is spun, then woven into cloth, which is dyed in the boiling dye solution, then hung to dry, as the mummy is prepared for entombment. The scene in the foreground points up many details of burial custom: the ornately fashioned "bed" in the shape of a dog; the small vessels beneath in which the entrails of the deceased were enshrined; the masque and the case of the mummy itself — decorative symbolism of deep meaning to the people of the age. The final wrapping of fine indigo-dyed linen was the last tribute to the departed spirit . . . the touch of elegance attesting the wealth and power which he had enjoyed among the living.

Skein dyeing • Package dyeing • Raw stock dyeing • Top dyeing • Tow dyeing

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Dyeing And Wet Processing Review

Dyeing Of Circular Knit Cloth On Beam Dyeing Machine

By GEORGE C. WARD
Applications and Product Development
Celanese Fibers Company
A Division of Celanese Corporation of America

WITH the considerable increase in production of tubular knitted fabrics, particularly from man-made fibers, dyers have recently been looking for improved, more economical methods of dyeing these materials. These fabrics are normally dyed in rope form on becks and to some extent in paddle machines. Fabrics dyed on these machines may suffer from stitch distortion and creasing.

One possible improved dyeing procedure which has been receiving considerable attention is the use of the beam dyeing machine, available in this country and Europe for approximately ten years. These machines have been used extensively for the dyeing of tricot and for loosely woven fabrics, open width and under controlled tension.

Newcomb and Ward described this type of machine in detail in the American Dyestuff Reporter, February 8, 1960. They also mentioned several types of fabrics which are being commercially processed by this method. The principle of this machine is essentially the same as that of package dyeing in that the fabric is wrapped smoothly and firmly on a perforated roll, placed in a dyeing chamber, and the dye liquor pumped through the roll. At predetermined intervals, the direction of the flow may be reversed from inside-out to outside-in. Flow reversal is generally practiced on woven but not on knitted fabrics where inside-out flow only is used. Some of these machines are designed so that they can be operated under pressure, and temperatures up to 300°F can be obtained.

These higher temperatures increase the dyeing rates for disperse dyes on triacetate and polyester fibers, and also set the fabric to achieve dimensional stability.

The principle of dyeing circular knit fabrics after splitting and gumming on the beam dyeing machine is entirely feasible and may have economical advantages. At least one American plant is dyeing tubular knit fabrics by this method. Fabrics which crease badly when dyed on a beck or paddle machine could be handled best on a beam dyer. Fabrics which are improved by heat setting—such as triacetate or polyester fabrics—can benefit because no other satisfactory method for heat setting tubular fabric has been devised. Fabrics which have a tendency to fuzz or mat down will process much better on beam dyers than on becks.

With the addition of a splitting machine, dyehouses equipped for beam dyeing of tricot can also handle circular knit fabrics. Gumming of the fabric may be essential, depending on whether the fabric to be processed will run or curl at the edges. Splitting and gumming machines can be purchased in this country from Joseph Pernick & Sons, and can be obtained from Tubular Textile Machinery Co. on a rental basis. On a fabric to be dyed on a beam dyer, it may be well to gum the edges with some substance which will not be removed by an aqueous bath. Such materials are available.

It is much easier to get and maintain high temperatures on beam dyeing machines than on other types of equipment. Yarns requiring high temperature dyeing can be dyed on this machine. As a general rule, dyeings made at a higher temperature will have better fastness and be more dimensionally stable than those dyed at moderate temperatures.

The most important manufacturers of beam dyeing machines in this country are Gaston County Dyeing Machine Co., and Burlington Engineering Co. The accompanying photograph supplied by Gaston County Dyeing Machine Co. shows the fabric loaded on the beam, ready for introduction into the autoclave for dyeing.

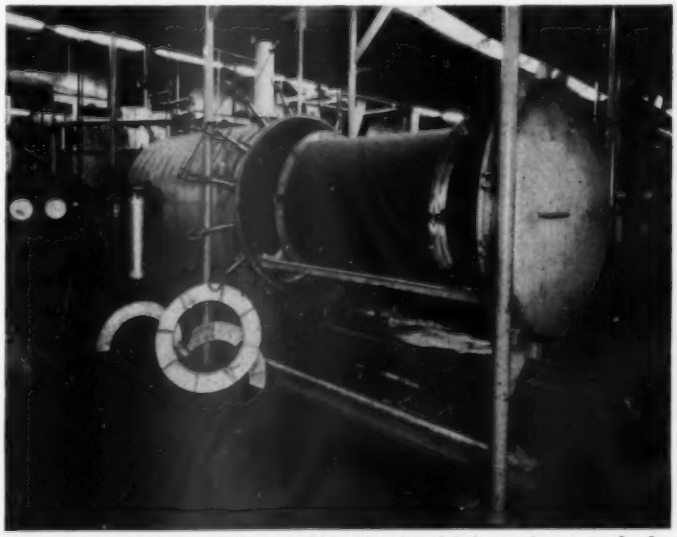
There are some sectors of the trade where splitting of the fabric may not be feasible. Ilma, of Schio, Italy, displayed at the 1959 Milan International Textile Machinery Exhibit a beam dyeing machine on which it was claimed that unsplit circular knit fabrics could be dyed uniformly. Only one of these machines is in operation in this country for the dyeing of circular knit fabrics, but orders have been placed for additional machinery. Dyeing of circular knit fabrics, unsplit, is feasible only if made from cotton fiber only, and possibly rayon or wool. Tubular fabrics made from the hydrophobic synthetic fibers would contain two permanent creases if dyed without splitting. The design of machines to handle tubular fabrics will be influenced by the demand for such equipment in this country.

Regardless of whether the fabric is split, proper application to the beam is essential for perfect results. If creases or air pockets are wound in, unlevel dyeing in the form of repeat marks will result. If the fabric is wound too loosely, the circulating liquor will bypass the fabric and unlevel dyeing will be obtained.

There are certain limitations as to what can be done on the beam dyeing machine. Among these are:

1. Fabrics containing high bulk yarns will not process well since the fabric is not given a chance to shrink in and bulk.
2. In tightly knitted fabrics, wild moire may result which will be observable in heavy shades.
3. Beam dyeing machines made in America at present will not handle fabrics satisfactorily in tubular form. This means that the fabric must be split before dyeing.

There is little doubt that the next two years will see considerable progress in the application of dyes to tubular fabrics on beam dyeing machines.



Gaston County beam dyeing machine showing fabric on beam ready for introduction to autoclave.

Piece Dyeing, Finishing Knits of Orlon Sayelle

(*Continued from Page* 21)

fabrics is still not entirely satisfactory, the steaming time—but not the steaming temperature—can be increased without the danger of "overbulking."

D. Tumble until dry. If the sweater or sweater parts are creased following pressure steaming, the drying temperature must exceed the highest steaming temperature by 2° F. to 3° F. for at least three minutes to remove the creases. The tumble dryer should be cooled to 120° F. before unloading.

During pressure steaming, some shades will increase in depth slightly and the dyer should take this into consideration in the shade matching.

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ZEFRAN* acrylic

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How are these yarns different from other seemingly similar combinations? Their *hand*, for one thing is truly *natural*—with the subtle texture so suited to the new trend in knits. A second (but equally important) difference is *performance*. Zefran acrylic is the *super*natural fiber which *combines* beauty with performance. These yarns possess outstanding resistance to pilling; and are dimensionally stable. Depending on construction, fashions of Zefran acrylic and wool are machine washable (on synthetic cycle) with block drying, or hand washable or dry cleanable.

Various yarns and wool blends are available from:

ARGONNE WORSTED CO., Manville, R. I. Sales Agent: Percy A. Legge, 432 Park Ave. South, N. Y. • DEERING-MILLIKEN, Sales Yarn Dept., 1045 6th Ave., N. Y. • FITCHBURG YARN CO., Fitchburg, Mass. Sales Agent: Latta, Currier, Co., Inc., 350 Fifth Ave., N. Y. • PAUL WHITIN CORP., Gilbertville, Mass. Sales Agent: Brant Yarns Inc., 1412 Broadway, N. Y. • Wm. WHITAKER & SONS, Tabor Road & "F" St., Philadelphia, Pa. • CARON SPINNING COMPANY, 459 Fifth Ave., N. Y.

THE DOW CHEMICAL COMPANY DOW

*Zefran is The Dow Chemical Company's trademark for products including fibers, yarns, fabrics.

Dyeing And Wet Processing Review

Recent Dyeing And Finishing Developments In Europe

ALTHOUGH no truly revolutionary pieces of equipment have been introduced to the dyeing and finishing trades of Britain and Continental Europe during the past twelve months, many machines have appeared which illustrate the trend towards closer control of proceedings and greater efficiency.

The Longclose Engineering Co., Ltd., Leeds, Britain, has developed a range of horizontal beam machines for dyeing both knitted and woven fabrics. Describing the units as the ideal means of bleaching and dyeing knitted fabrics, the company says the equipment is particularly suitable for man-made fiber cloths. Fabric is dyed in the flat open widths, without crease marks. Warp knitted cloths do not have to be sewn into tubular form. The advantages of this method include the use of short liquor ratios, larger batch weights, greater ease of handling and beams which have telescopic adjustment for differing widths of fabric.

Wide Range

The Longclose range of these machines now embraces equipment, suitable for fabrics up to 120 inches wide, both of the high temperature type for dyeing at temperatures up to and even exceeding 130°C and non-pressurized machines for use at temperatures not greater than boiling.

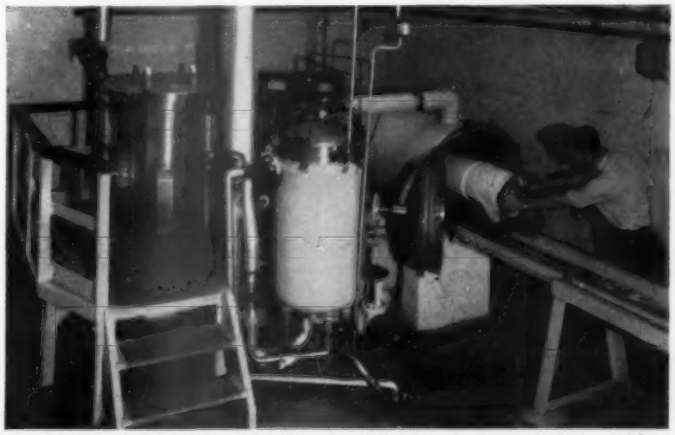
The high temperature type units, complete with automatic process control equipment, have the Longclose quick acting pressure cover, a full range of sampling and addition units, and full capacity reserve tanks.

The same company has also introduced a new range of high pressure dyeing units called the Longclose Easy-to-Work machines. These units can operate with packages, ball tops of different sizes, bumped tops of of crimped filament yarns, and loose staple fiber. They can be used at temperatures up to and greater than 130°C. Again, these units have a quick acting pressure cover operated by one hand-wheel only. This cover is stainless steel. A full range of sampling and addition components is fitted.

Kovo Export, the official exporting agency of the Czechoslovak Government, showed a new automatic dyeing jigger at this year's Brno International Trade Fair. This unit uses a system which drives the rollers by a differential electric motor. The total r.p.m. of the rotor and stator remain constant, but the revolutions of each vary according to the momentary diameter of the drawing roller and wound-on fabric. Tension required in the fabric is created by adjusting brakes. An automatic reversal of direction of the motor is activated just before rewinding of the fabric from one roller to the other is completed. This latter arrangement consists mainly of two counters: one adds, the other subtracts, the set number of revolutions. The electric motor cuts out after the set number of passes. Average speed of the fabric is 60 meters per minute, the machine being a one-speed unit.

New Dye Jig

At the recent Hanover Fair, the Gebr. Poensgen showed another new dye jig, the Cyclotric. This has been designed to insure constant operating speed and tension in the fabric. Each winding roller is coupled to a driving cone through a reduction gear and magnetic coupling. A pair of friction wheels engaging the cones is controlled by a double-crank mechanism. The drive is governed by a dancer-roller which also acts as an additional safety stop device.



Longclose horizontal beam bleaching and high temperature dyeing machine.

The machine is two-speed, has no driving parts running in oil, no brakes. Winding rollers are adjusted laterally.

A French company, at the same exhibition, showed a fully-automatic dye jig with a squeezing roller which can be swivelled to either of the jig rollers. The company was Industrie-Companie.

Samuel Pegg Units

Samuel Pegg & Son, Ltd., England, have developed twin couped high temperature pressure dyeing machines for dyeing and bleaching a wide range of synthetic and natural fibers as loose stock, yarn (in package or beam form), muffs, cakes, rockets, tops or hanks. The machines can operate independently, or as one unit when large batches are being processed.

Another beam dyeing unit for high temperature work has been developed by B. Thies Spezialmaschinenfabrik, West Germany. This is for both knitted and woven fabrics, either of synthetic fibers or blends. All handwheels and instruments are neatly located on one instrument panel, and the addition and preparing tank is located near to this panel. These features make the operative's job easy. Circulation of dye liquor is carried out by a Turbo pump. The company states that the pump reverses the circulation from inside out and vice versa without using a four-way system which increases resistance in the circulation. An additional pressure increasing and addition pump can give pressure within the system and can add liquor to the dye bath when the bath is at high temperature and pressure. A pressure and expansion vessel which serves as a pressure cushion is included in the circulation system. This permits liquor to be added without excess liquor having to be drawn off.

Fully or semi-automatic control can be fitted by which either the dyeing process only or the whole finishing process can be controlled by hand or by a special punched card system.

It is probably safe to say that in Europe knitters show as much interest in tow and slub dyeing as they do in piece dyeing. Therefore, the announcement by the Italian company, Ilma S.p.A., of a new unit for this type of processing aroused a great deal of interest. So far few details are available about the unit but it is reported to be one of great flexibility.

New Units

During the past year several new screen-printing units have appeared on the market. The latest by Maschinenfabrik Zimmer, Austria, can produce a range of repeat from sixteen inches of eighty inches, with a degree of accuracy of step of .008 inch. This adjustment is carried out by an auxiliary electromotor with fine adjustment by turning a handwheel (a complete turn of this handwheel increases or decreases a repeat length of .004 inch). Zimmer claim the machine will print any type of fabric in any sort of design, up to seventy-two inches wide. In theory the number of colors in the design is unlimited, but the company recommends such combinations as 6, 8, 10 or twelve.

The unit consists of a solid steel framework supporting the rollers carrying the endless printing blanket, the cloth feed, printing, gumming and washing units, and an optional apparatus for intermediate warm air drying. A drying chamber using warm air jets and an electrically operated cloth folder are fitted at the delivery end. A batch roller device can take the

(*Continued on Page* 39)

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a bright neutral white for acrylic fibers, acetate and triacetate; stable in chlorite bleach.

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high affinity, for cellulosic fibers, good wash fastness, high solubility, stable in peroxide bleach and discharge print pastes.

®**PHORWHITE BBN Solution, BBU Extra Pdr., BBT Extra Pdr.:**
low affinity, for cotton and rayon, no tailing, stable in most commonly used resin finishes.

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for cotton and rayon, outstanding leveling properties, for short liquor ratio applications.

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for wool, nylon, silk, and acetate

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A DIVISION OF VERONA-PHARMA CHEMICAL CORPORATION
Manufacturers of Dyestuffs, Intermediates, Organic and Aromatic Chemicals
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place of the cloth folder. Electrical components are kept down to a minimum.

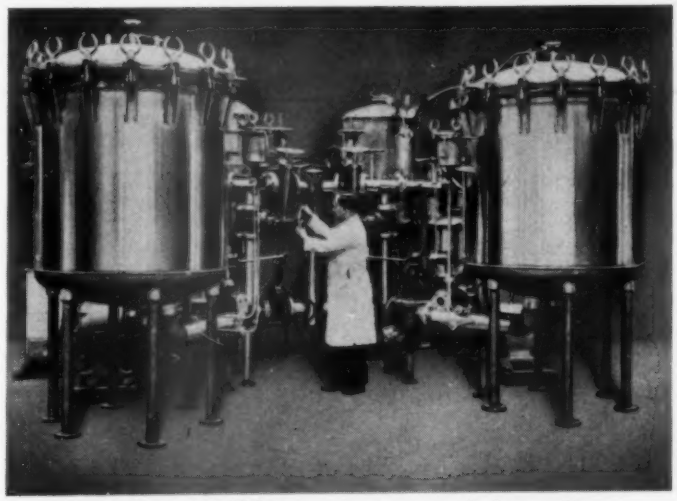
The colors are applied by roll-type squeegees of variable diameter. These are placed loosely on the screens. This method, without any mechanical fitting being needed, makes it a fast operation. Motion of the squeegees and their pressure is controlled by a patented arrangement of electro - magnets which is moved hydro-mechanically. Screens can be of any type providing for squeegeeing in the warp direction. One printer and one assistant can usually operate the machine, although one other assistant may be needed for a high number of colors.

A Model A1 automatic screen printing machine, by Meccanotessile, Italy, is gaining a good reputation in Europe. This unit has a drive which is entirely electro-mechanical. There are no pneumatic or hydraulic moving components. The makers claim that it can be used to print on fabrics of virtually any fiber, in from eight to sixteen colors. Standard printing width is 160 cm., but wider units can be specially built. It is said that the indexing of the endless blanket and the adjustment of the screens is an easy and fast, yet precise, operation and that this makes the unit extremely suitable for short runs.

The feed unit has an electrical device for the automatic alignment of the selvedge. Pressure rollers ensure the fabric maintains close contact with the endless blanket.

Each squeegee mechanism has its own electrical motor and independent drive. Number of passes of each squeegee can be fixed, independently of the other squeegees, from one to four. Individual squeegees are interchangeable. Each screen has two squeegees, and their pressure on the screen is adjustable. The rubber squeegees are carried in a light metal section, and their profiles may be varied to suit the type of printing being carried out. Repeats can vary from 380 mm to 1000 mm in length, to within an accuracy of ± 1 mm.

A washing and drying apparatus for the endless blanket is fitted under the machine. It can be removed for cleaning or lowered if resin has to be applied to the blanket.



Pegg twin-coupled high temperature pressure dyeing machines.

Comerio Ercole S.p.A., another Italian company, has also introduced a new automatic screen printing machine. This is called Type SQTP, and is designed for repeats ranging from 12 inches to 118 inches. It has a particularly sensitive device for applying the paste used for holding fabric to the blanket during printing.

Sir James Farmer Norton & Co. Ltd., are now building a new type of plant for coating and gelling polyvinyl chloride onto all types of fabrics ranging from natural to synthetic fibers. The company stresses that the equipment is particularly suitable for knit fabrics.

The installation includes an unwind stand, twin head coating machine, vertical rail type pin stenter, embossing machine, cooling drums, and a batching-up unit. The coating head is precision built and gives a perfectly uniform coating over the fabric. Coating is done between a doctor blade, metal plate and metal roller, and is said to guarantee a uniform film. The doctor blades have a virtually micrometer control across a range of 10 g. to 1.8 kilos per square meter (tolerance is as low as .0005 inch). Doctor blade settings, both laterally and vertically, are completely reproducible, say this British firm.

The stenter section is a forty foot vertical rail type pin unit. Distance between the second coating head and the pins is short. Special electric cloth guiders ensure accurate pining-on. Heating for gelling and drying is by infra-red heaters arranged in banks above the cloth. These banks can be raised and lowered independently, and special temperature control apparatus is fitted.

View of the screen and squeegee of latest Zimmer screen printing machine.

The embossing machine has hydraulic pressure action, and quick release bearings are fitted to the top bowl for easy changing. An infra-red unit is fitted just before the nip to maintain the required temperature.

Each of the integral parts of the plant has its own drive.

Grimsley & Co. (Leicester) Ltd., Britain, has introduced a calender for shrinking to size, pressing and finishing rubberized fabrics, open width fabrics, and circular knitted fabrics and the unit is claimed to be the most flexible machine of its type currently available. It will put a decatized finish on double jersey and similar construction, stretching to any required degree over stainless steel formers, and will finish open-width or tubular fabrics without formers. Circular-knit fabrics, it is reported, can be reduced up to one inch (± ¼ inch) from knitted width, as required.

The machine is basically two steam chests. Fabric is drawn through these intermittently over the stainless steel formers in lengths of 32 inches at a time. It is then steamed for a set time, and then vacuum extracted for another pre-set period.

New Foron Disperse Dye Announced By Sandoz

Release of four new disperse dyes in the Foron line has been announced by Sandoz, Inc. All are suitable for use on polyester fibers, and are said to be superior in fastness to any available dyes similar in shade.

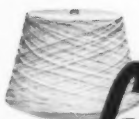
The four are: Foron Red FL ultra-dispersed Pat., termed "the first true, full red" (in disperse dyes) with all-around fastness properties; Foron Rubine GFL ultra-dispersed, a rubine which is fast to light, washing, sublimation, perspiration, pleating, and dry cleaning; Foron Scarlet BWFW ultra-dispersed p.a.f., a bluish scarlet with daylight fastness of L 6-7; Foron Yellow Brown 2RFL ultra-dispersed Pat., which is being recommended as a base color for tan or brown shades on polyester and polyester/wool blends. The red, rubine, and scarlet are suitable for high temperature dyeing.

GOOD YARNS and GOOD DYEING

In this special issue, Caron salutes the dyeing industry, and offers congratulations on its tremendous contribution of constantly improving color treatment for the knitwear field. Their continuing development of new shades and new processing refinements help to insure that superlative Caron yarns reach the quality-conscious buying public in garments with all the softness and beauty built into them at our mill.

It takes close working relationships and warm, sincere cooperation to make these benefits possible. Caron extends its thanks to our friends in the dyeing and finishing business who help protect the quality of our yarns by giving them the color treatment and handling they deserve.

Caron makes good yarns!



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Dyeing And Wet Processing Review

Screen Printing Of Fabric Via Automatic Machinery

By FRANK PERUTZ
President, Lana Knitwear, Inc.

AFTER a great many years of evolution and development, automatic screen printing has become one of the most important tools in the art of textile printing throughout the world. There are 458 automatic screen printing machines in operation all over the world. Of this total, 277 are in Europe and only 35 are in the United States. Italy and France alone operate 136 machines. Practically every cloth printer all over the world operates them, with some of these installations consisting of six and more machines. In the United States many of our fine screen printers have started to mechanize their hand operations and have installed automatic screen printing equipment.

Screen Print Advantages

How competitive is automatic screen printing today? I believe that many of you are familiar with the superior quality of automatic-screen prints, the brilliance and depth of the colors, the accuracy of the repeats and the versatility of designs. Screen prints possess a casualness, an easy-to-live-with quality, preferred by the discriminating buyer. It has been exceedingly gratifying to see a very definite trend toward better styling in all fields. Screen printing can help you create the wide assortment of designs you need, with less yardage. It is sufficiently flexible to produce contemporary styling, capable to adjust itself to the job. It permits you to experiment quickly and economically and put your imagination to work. Competition, and particularly competition with imported fabrics, is more and more predicated upon quality, style and usefulness. I believe that screen printing can help meet the ever-increasing demand for better products and its use will continue to grow right along with a prosperous America.

In comparison with manual operation, automatic screen printing has the advantage of greater accuracy of fit and, of course, the labor cost differential, which amounts to from one-half for large table-top covers to one-fourth for multicolor dress goods.

I would like to point out some particular differences of the various types of machines installed in this country. On some machines, such as the Comerio (Italy), Stork (Holland), Thorne (U.S.A.), and Ichinose (Japan), the blanket is driven by the roller on the exit end of the machine and also braked there. Buser (Switzerland), Reggiani (Italy), and Zimmer (Austria), have adjustable idler rollers on the end of the machine and firmly grip the blanket all the length of the machine while moving and stopping it. In my opinion, and particularly on the very large size equipment now being installed in this country, the latter method is the only one to obtain the great repeat accuracy which is required by our customers, particularly the one used to roller printing. The removable individually motor-driven printing head is certainly a feature to be considered on the Reggiani and Buser machines. On most others the squeegee drive is part of the machine and not individually adjustable.

Features In Dispute

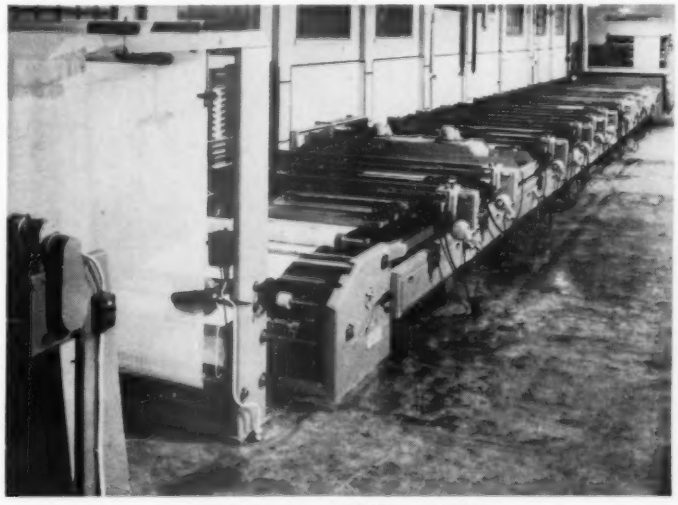
Other features, such as hard or soft table, hard or soft squeegee, and printing in warp or filling direction are still disputed and up for future discussion. Which will prove best for our production methods only the future can tell.

All machines claim top printing speed. However, printing speed depends on the type of work you are doing, on your quality requirement, and, of course, on the capacity of your dryer.

Only two types of machines, Reggiani and Buser, have been operated on a large scale for several years in the United States. Four plants employ three Buser machines each. One plant runs six Reggiani machines. Some of these machines are the longest and widest built by either firm. Both makes of machines have for several years gone through an evolutionary process to adapt them to the requirements of large-scale American production.

Reggiani Versatile

The Reggiani machine is very versatile and accurate, and prints in the filling direction. The blanket is moved by pneumatic clamps applied at a distance of two meters on both sides the full length of the machine. Repeats, with positive stops, are possible up to 130 inches. The printing heads are individually motor driven, are run on rollers on rails, and are easily positioned. The double oscillating squeegee can be micro set for angle, pressure and stroke, an outstanding feature of this machine.



Reggiani screen printing machine.

Reggiani recently developed two special devices, one for printing on back greys, which is essential to produce quality prints on fine silk fabrics; the other, a device which makes the printing of sheer knitted fabrics such as 15-denier nylons possible. The difficulty in taking the fabric off the printing blanket without curling of the edges and consequently marking off, has been overcome.

Buser is also a versatile and accurate machine printing in the filling direction. The printing heads are individually motor driven and run on rails. The speed and the number of strokes are individually adjustable.

The printing blanket is moved by solid electromagnetic clamps which hold the blanket the full length of the machine on both sides. Repeats up to 154 inches are possible.

There are four Stork machines operating in the United States. The Stork is an excellent and fast machine, printing in the warp direction. However, the size of the repeat is rather limited, only 39 inches up to seven colors and 24 inches for 12 colors on the largest model. According to the literature, the newest models have a micro adjustment of the repeat.

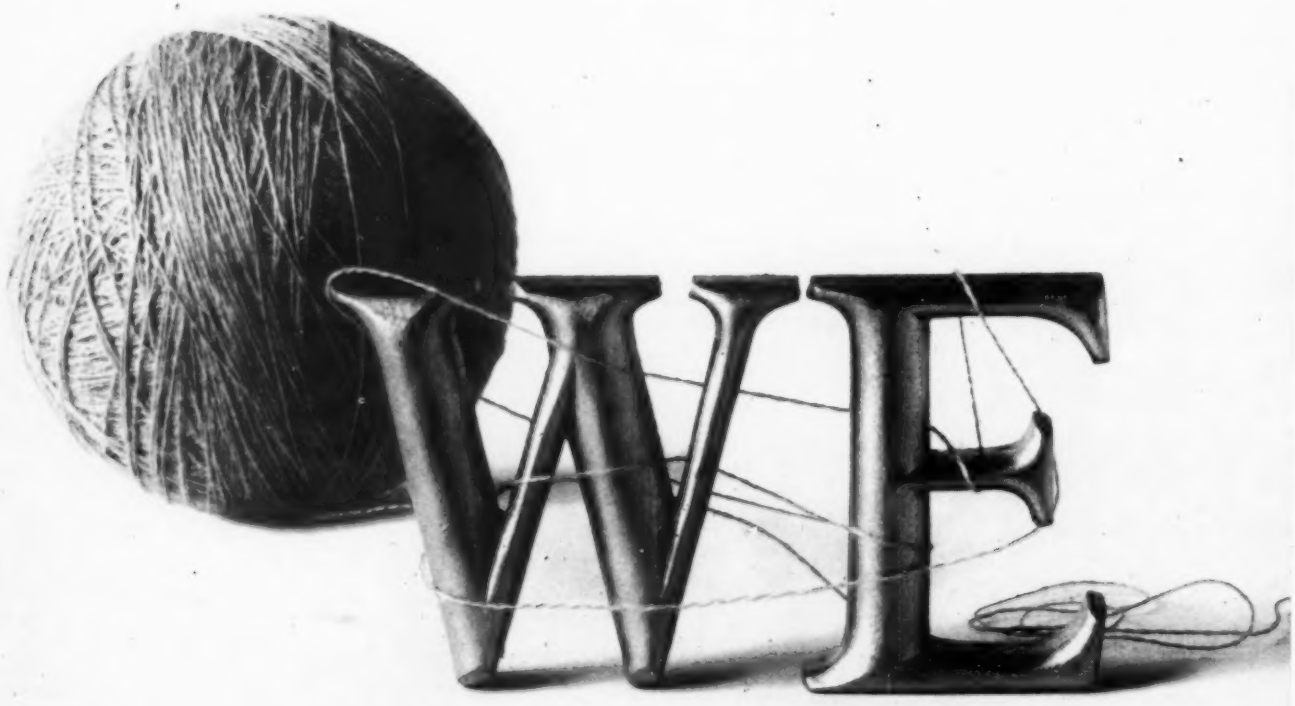
Economy And Quality

The scope of this article does not permit me to describe fully the other types of machines, each of them having only one installation in this country.

More and more garments manufactured of knitted fabrics can be seen in our stores. The fashion trend calls for more color and more style. Knitted fabrics printed on the automatic printing machine will give our stylists the possibility of a greater selection of styles and a greater versatility of color combination and all this without excessive cost.

Seifert Technical Sales Manager at Sandoz

Appointment of Hans Seifert, Sandoz technical sales representative, to the position of sales manager, Chemical Division, has been announced by R. A. Lindenmaier, vice-president and manager of the division.



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Dyeing And Finishing

Morgan Expands Orlon Package Dyeing Operation

By BENN OLLMAN

ROCHELLE, Ill.—Package dyeing of Orlon yarns has developed into a specialty here at Morgan Dyeing & Bleaching Co., Inc. To meet the challenge presented by the fast-growing flood of synthetic fibers, Morgan Dyeing & Bleaching Co., Inc. began a major plant and equipment expansion and improvement program in 1955. Since then the firm has substantially increased its array of both package and skein dyeing equipment.

High temperature package dye machines were the most recent important installation. Morgan has also added 14,000 square feet to its finishing and shipping departments plus another 20,000 square feet for yarn storage.

"All of our new equipment has been designed for one basic purpose—to eliminate as much as possible the variables in this tricky business," says company president Iver Rolfe. "So much depends on the human element of judgment and skills used in this work. Since every dye batch is a custom job, experience, research and proper equipment are the necessary combination."

Big Investment

All told, the firm has invested nearly three quarters of a million dollars in equipment and building expansion in the past six years, according to Rolfe.

"Most of this money was earmarked for new equipment to help us handle the expanded volume of synthetic fibers," he said. "But, the equipment can also be used for dyeing worsted yarns."

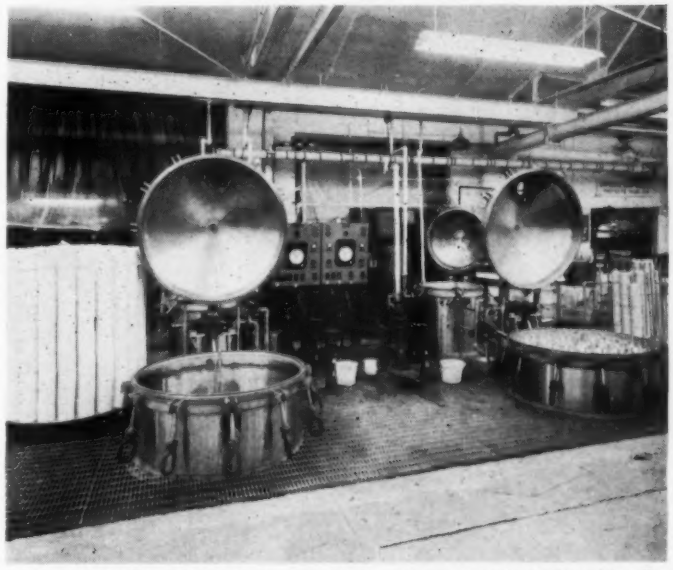
Morgan was founded in 1923 by Edward W. Morgan. Before going into business for himself in 1923, Mr. Morgan worked this territory as a salesman for National Aniline. He created such a favorable impression on one of his customers, the Caron Spinning Company, that they hired him to run their dye house.

Rolfe Took Over

Five years later, in 1928, he opened his own commission dye house. He died in 1946 and was succeeded by Rolfe.

Caron's hand knitting yarn dyeing is still done here, but Morgan has expanded tremendously since Mr. Morgan dyed his first lot of yarn in 1923 in the plant he founded. Its sizeable volume today comes from knitters and spinners in all parts of the country. East Coast and Midwest knitted outerwear manufacturers account for roughly 80 per cent of the volume dyed here. The blance comes from a steadily climbing list of Southern and West Coast customers.

To keep abreast of demand, Morgan operates on a two shift schedule in its dye house and three shifts around the clock in the finishing departments. During peak periods between April and September, the roster climbs to 280 employees.



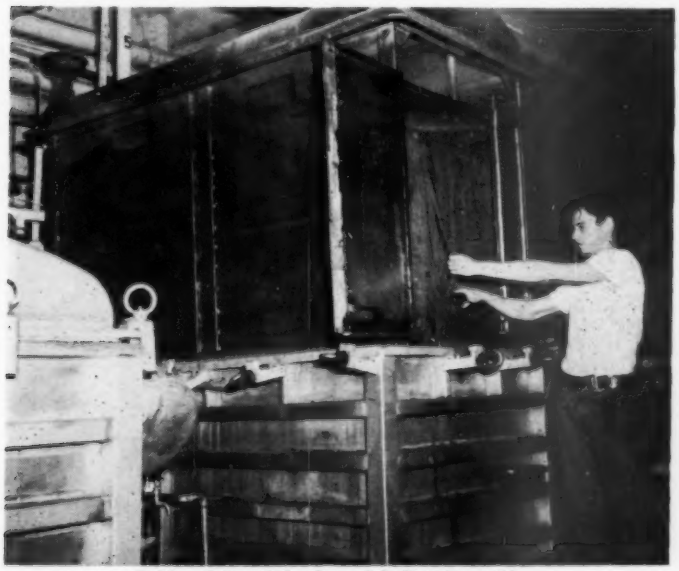
Recently installed package dyeing machines at Morgan Dyeing & Bleaching Co.

Improvements Cited

Morgan executives admit that like most commission dye houses, they have been forced to make these extensive improvements in order to remain in business. The knitted outerwear industry's clamor for lower cost finished synthetic yarns has led to the emphasis here on package dyeing.

The high temperature Gaston County package machines installed can handle 1,000 pound lots of synthetic yarns at peak efficiency when operated singly. In tandem, the two kiers using interchanging dye liquor, can produce double that amount. The length of the process, depending on yarns being dyed, and coloration sought, averages about four hours per dye cycle.

(*Continued on Page* 45)



Taking Orlon skeins from Scholl tank machine.

Loading skein dyed yarn into dryer.

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While the firm's volume of package-dyed yarns has grown to gratifying heights, skein dyeing capacity has also been enlarged. Several Scholl type units and Italian-made Ilma machines for skein dyeing synthetic yarns were included in the expansion program. These machines are capable of dyeing 40 to 1,000 pound lots of yarn at one time.

Reclaim Heat

Also included in the modernization project was a system of reclaiming heat from process waste water formerly piped out of the plant. The heated waste water is now used to warm the supply of incoming well water. The heat recovery system has cut fuel consumption and slashed dye kettle fill time from a former 25 or 30 minutes to five or six minutes.

Engineering consultants are currently conducting an efficiency study of the entire plant facilities. Close attention is being given to means of improving the efficiency of the flow of work as well as warehousing and shipping techniques.

"We have instituted a lot of improvements in the past few years," Rolfe explained. "But, we are far from satisfied. To remain competitive in this industry you have constantly to search for ways of increasing production and cutting costs."

Here, as in most modern mills, the laboratory is considered the starting point of each dye order. The staff of experienced chemists and technicians conduct color research and quality control testing in exceptionally complete laboratory facilities.

Backwound Yarn

Every cone of package-dyed yarn is backwound at least twice to insure consistent density before shipping. Extreme care is also taken in bundling skein yarn before shipping to the customer. Each skein is carefully inspected, manually straightened and put in layers before bundling.

In addition to its president, the lineup of Morgan Dyeing & Bleachin'g top brass includes Henry Kaminski, vice-president and treasurer; F. J. Connolly, vice-president and secretary, in charge of purchasing; James McGowan, vice-president, production, and Harry Loefgren, vice-president, sales.

Factors Affecting Washable Wool Knitted Apparel

(*Continued from Page* 32)

solidation of some type when first tumbled in these dryers. If garments are wet finished and tumble dried as an industrial procedure, they will then show no further shrinkage in subsequent tumbling cycles. These can be specified as satisfactory for machine washing, machine drying.

If garments or fabrics are not tumbled during manufacture, they may shrink a significant amount during their first home laundering-drying cycle, and so should not be claimed as "machine dryable", even although they may have been given a chemical treatment to prevent true felting shrinkage. If the garment maker does not have these facilities available, it is possible to tumble dry fabric lengths before garments are cut in order to obtain garments fast to these "fully automatic cycles."

Fabric Construction

For satisfactory production and performance of shrink-resistant knitwear, the important factors of fabric construction, degree of chemical treatment, finishing procedures, and laundering procedures must be considered simultaneously. It might well be that the comparative failure of shrink-resist chemical processes to make a large impact on the textile market is due to the fact that all these features have only rarely been considered together. Shrink-resist processes are extremely effective in producing the effect claimed, i.e. reduction in felting shrinkage, but cannot of themselves completely overcome poor construction and cannot prevent the relaxation on wetting due to yarns having been stretched excessively during pressing. Nor can all treated wool knits be laundered indiscriminately; some treated structures will perform much better than others. This needs to be clearly recognized by manufacturers and the knowledge imparted to consumers by reasonable statements of the performances to be expected of their garments in modern home laundering procedures.

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Package Dyed Acrilan Yarns

(*Continued from Page* 23)

less critical and the liquor flow may be reversed periodically if desired; momentary stopping of the pump as the liquor flow is reversed will do no harm; and baths at temperatures lower than 160°F. may be dropped.

5. Final cooling of the dyebath down to 160°F. should be carried out slowly.

From one to two per cent of a suitable cationic type softener may be applied to the package of Acrilan after dyeing if desired. For best results when applying the softener, the temperature of the softening bath should be 120°F. to 130°F. and the pHd should be approximately 6.0 to 6.5.

Extracting — The procedure recommended to centrifugally extract Acrilan in package form is very similar to that for cotton, rayon, or wool except that the following should be observed.

1. The packages should be packed in a vertical rather than in a horizontal position—otherwise the centrifugal force will throw the yarn off the springs or tubes.

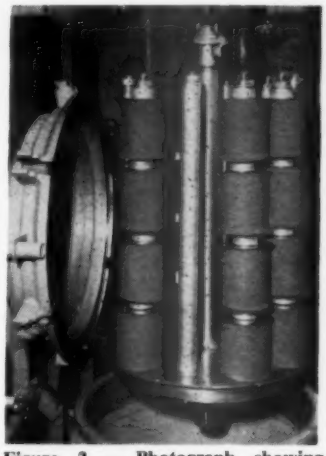

Figure 2 — Photograph showing packages of Acrilan 16 which have been dyed on dye tubes. Dyeing is much less critical when the packages have been wound on dye tubes as oposed to springs. Nevertheless, excellent results are obtainable when springs are used.

2. Vertical positioning of the packages in the extractor cage makes it necessary to put wooden inserts inside perforated tubes prior to extraction to prevent the tubes from being flattened by centrifugal force.

3. The extraction cycle is much shorter.

Drying—To prevent any possibility of color migration, the packages should be dried as soon as possible after dyeing. Both Acrilan and Acrilan 16 dry easily and quickly and, as with other fibers, the time and temperature needed to dry the packages depends on per cent moisture removed during extracting, package diameter, type dyestuff used, and type dryer. When drying in an oven type dryer a drying time of from four to six hours at 160°F. to 200°F. will normally be satisfactory for Acrilan on packages. If on the other hand, a forced air type dryer is used, the total extraction-drying time will generally be one hour at 240°F. to 260°F.

Rewinding—After drying, the yarns of Acrilan are ready to be rewound on to cones or bobbins. If the yarn is to be used in a product demanding soft, lofty characteristics, the use of coning oils and emulsions should be avoided, since these products will tend to flatten and deaden the yarn.

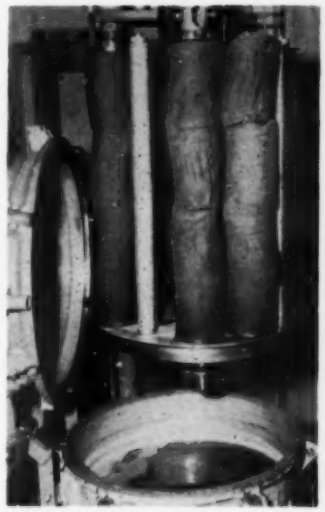

Figure 3—The spindles on the machines were designed for four six-inch packages and the machine is loaded four high. It is quite evident that the top packages are almost half again as long as the bottom packages.. The large wrinkles in the packages are a result of the breathing action of the soft packages as the liquor flow was shifted. Needless to say this dyeing was very unlevel. A level dyeing could have been produced by loading the spindles five high, maintaining the liquor flow from the inside to the outside and by observing the principles of dyeing laid down in this article.

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Multi-Coloring Of Type 44 Orlon For Knitwear

(*Continued from Page* 19)

shades such as navies and blacks. Either fiber may be dyed to the darker shade.

Reserve effects are obtainable by dyeing either the Orlon Type 44 component or the Orlon Type 42 component. Many styles of this blend of fibers have already been cross dyed successfully to sharply contrasting color effects.

Bright Shades

While the selected acid colors dye the Orlon Type 44 component to unusually clear, bright shades, it is suggested where possible that in dyeing this blend the brighter shades be reserved for the Orlon Type 42 component. In this manner, the dyer can take maximum advantage of the excellent base fiber whiteness of the Orlon Type 42, and the inherent brightness of cationic dyes used for this fiber.

Disperse dyes should not be used for this combination of fibers. These dyes will color both Orlon fibers and thus shade control on each fiber cannot be manipulated.

Dyeing Procedure—The dyer has at his disposal a simple one-bath procedure for dyeing Orlon Type 44 in combination with Orlon Type 42. A complete spectrum of shades can be dyed to contrasting tone-on-tone or cross-dyed effects. Control of shade during dyeing on each fiber of the blend is excellent and easily attained. Experience has shown that reproduction of shade from laboratory to scaled-up dyeings, and from lot-to-lot, is good. The dyeing procedure used is as follows (all percentages based on total weight of goods):

1. Set the bath at 100° to 120° F. with: 0.50 to 0.75% Capracyl Leveling Salt, 5.0 to 8.0% Glauber's salt, anhydrous, X.X% Acid dye, 3.0% Sulfuric acid, concentrate (this will give a pH of approximately 2.0 to 2.3).

2. Raise the dyebath temperature to 160° F. at 3° F. per minute.

3. Raise the temperature to 185° F. at 1° F. per minute.

4. Add at 185° F.: 0.0 to 0.5% Du Pont Retarder LAN for light and medium shades; the amount of retarder should be decreased as the per cent color increases, X.X% cationic dye.

5. Run 10 minutes at 185° F.

6. Raise the temperature to 210° F. at 1° F. per minute.

7. Dye one to two hours at 210° F. Light to medium shades can usually be dyed in 1 to 1½ hours, and heavy shades such as navies and blacks will require approximately 2 hours. These recommended dyeing times, and temperatures as close to 210° F. as possible, insure proper build up of shade and transfer of the acid and cationic dyes to the respective components of the blend.

8. Sample and cool slowly to 160° F.; rinse well.

9. Apply from 0.2 to 2.0% cationic softener in a fresh bath. (Details of application discussed below).

10. Extract and tumble dry at 180° to 200° F. Cool while tumbling.

11. Finish as desired.

If it is found necessary to adjust the shade of the goods by making a dye add, the bath should be cooled to 150° F. before adding acid dyes, and to 185° F. before adding cationic dyes. The necessary dye is added, the temperature raised to the boil at 1° F. per minute, and the dyeing finished according to the foregoing dyeing procedure.

Reserve effects can be obtained on either component of the blend by employing the same dyeing procedure with suitable alterations.

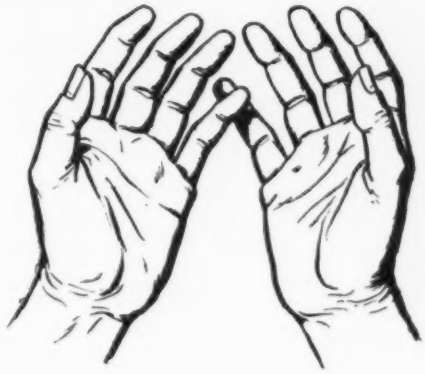
Check Points — In order to obtain good results, the importance of certain factors related to the dyeing system should be emphasized. Adherence to the recommended dyeing conditions will produce excellent levelness, shade control, and reproducibility of shade from lot-to-lot.

(a) Dyebath Acidity — The concentration of sulfuric acid used should be maintained at three per cent on the total weight of goods for all shades. This will give a pH of about 2.0 to 2.3. Concentrations of acid in excess of this amount may cause unlevel dyeing; lesser amounts may produce difficul-

(*Continued on Page* 51)

WE'RE OLD HANDS

SINCE 1882



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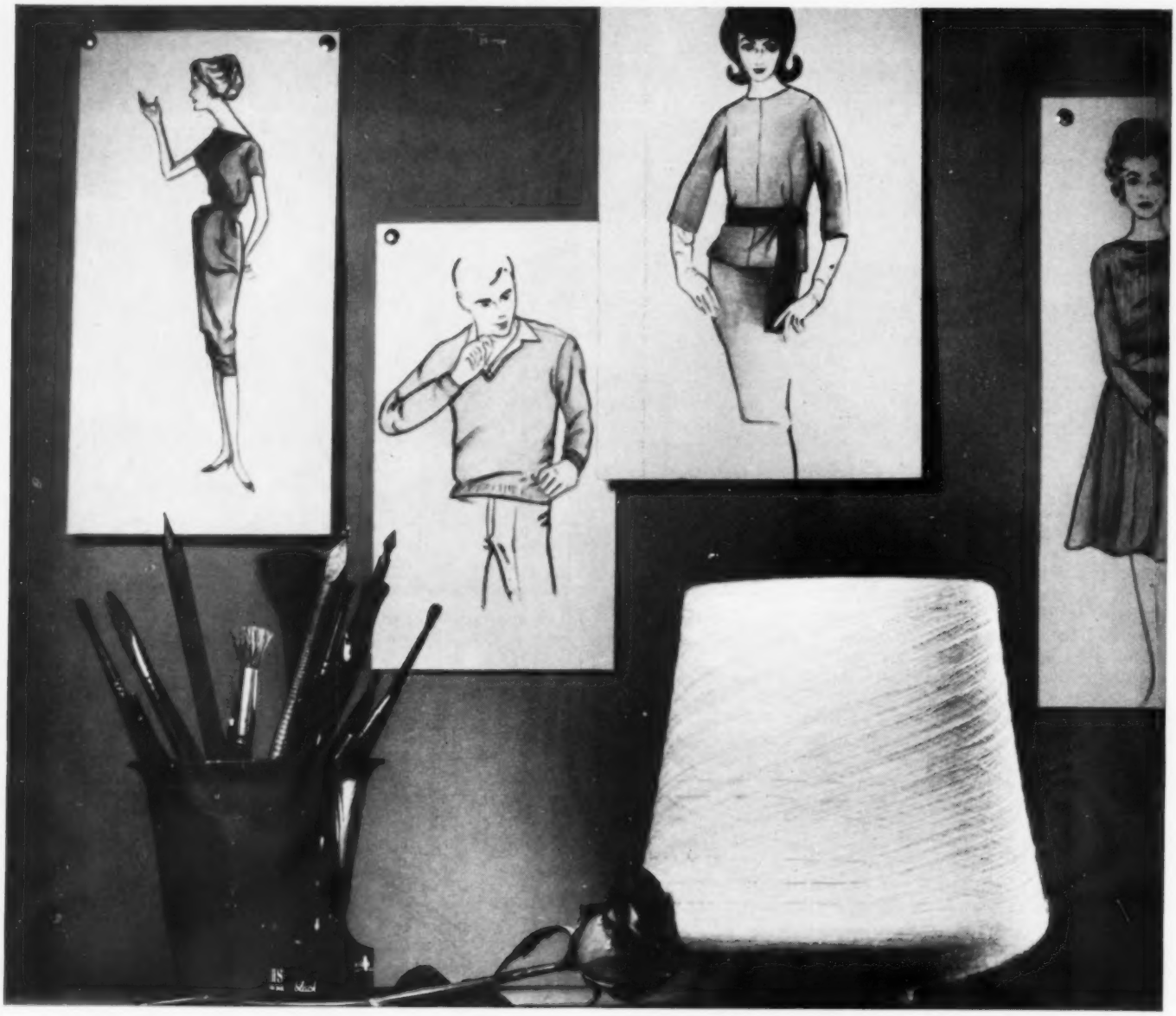

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ties in exhausting color from the bath.

(b) Temperature Control — Control of the rate of temperature rise from 160° F. to the boil is required to produce level dyeing of Orlon Type 44 acrylic fiber with acid dyes. Acid dyes do not transfer on Orlon Type 44 as they do on wool, and the excellent fastness properties of acid dyes on this fiber are the result of this dyeing phenomenon. Thus, to produce a level dyeing, the dye must be made to strike levelly by means of temperature control.

A full boil, as close to 210° F. as possible, is most important in achieving good exhaustion of color, clarity of shade, and shade reproducibility. Temperatures below 205° F. will not produce satisfactory cross dyeing of the combination of Orlon Type 44 and Orlon Type 42. Closed equipment and top steam should be used to get the proper dyeing temperature.

(c) Dyebath Auxiliaries—The use of Capracyl Leveling Salt is strongly recommended for this dyeing system. Comparative tests made with other similar nonionic compounds have shown Capracyl Leveling Salt to be the best agent known for controlling levelness of the acid dyes and clarity of the cross-dyed shades.

The recommended amounts of Du Pont Retarder LAN are sufficient under the dyeing conditions used. These amounts—0.5 per cent for light shades, less for medium shades — will adequately control the levelness of cationic dyes on Orlon Type 42, and larger amounts should not be used.

(d) Exhaustion of Acid Dye —It has been noticed that some acid dyes will exhaust completely on Orlon Type 44 acrylic fiber at temperatures below the boil. This exhaustion, however, is largely surface dyeing and is not adequate for good fastness properties. Such a dyeing must still be carried to the boiling temperature for good results.

Scouring, Bleaching, and Stripping — Blends of Orlon Type 44 with Orlon Type 42 can be scoured efficiently using 1 per cent of Duponol RA plus 0.5 per cent glacial acetic acid on a fiber weight basis at 165°

(*Continued on Page* 53)

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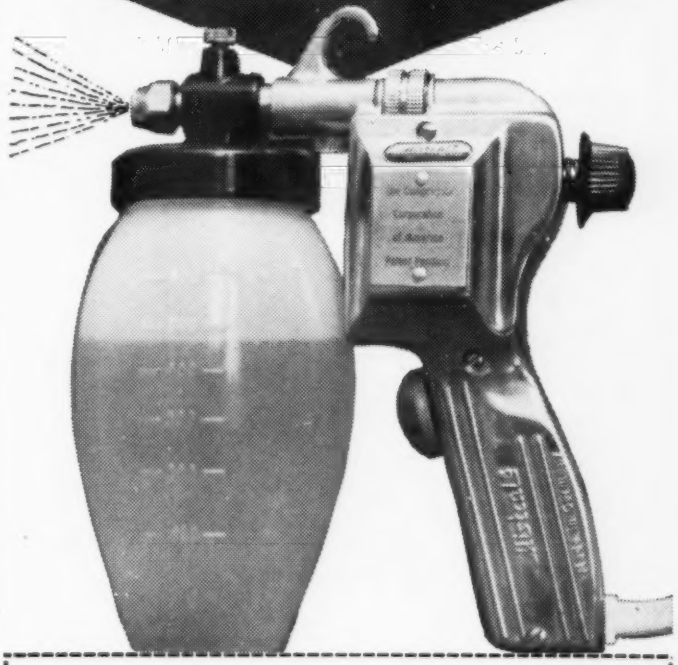

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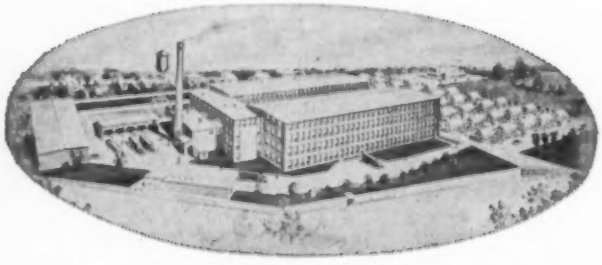

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F. for 20 minutes.

Bleaching formulations and procedures normally used for Orlon Type 42 will give good results on blends of Orlon Type 44 with Orlon Type 42.

Stripping formulations and procedures employing sodium chlorite or sodium hypochlorite, normally used for Orlon Type 42, are recommended for combinations of Orlon Type 44 with Orlon Type 42. If it is desired to strip only the Orlon Type 44 portion of such a combination, commonly-used procedures employing zinc formaldehyde sulfoxylate can be used.

Softeners — In general, the requirements for softening this blend of fibers are more critical than those for fabrics of Orlon Type 42.

The softener used must exhaust uniformly on both fibers of the blend, otherwise one or the other component will feel softer. This effect is more noticeable in stripes and patterns in knit goods than in heathers. Selected cationic softeners have been found which are more effective than anionic types on Orlon Type 44 acrylic fiber, and thus will soften both fibers of the blend satisfactorily. The following cationic softeners have been found to give good results in softening blends of Orlon Type 44 with Orlon Type 42:

Softener 366—Scher Brothers, Clifton, N. J.

Ceranine HC—Sandoz, Inc., New York, N. Y.

The procedure for softening the goods is as follows:

1. Set a fresh bath at 100° F. with 0.1 to 2.0% cationic softener.

2. Adjust the pH of the bath to 6.5 to 7.0 as required with dilute acetic acid or ammonium hydroxide.

3. Raise the temperature to 120° F. at 2° F. per minute.

4. Run 15 to 20 minutes at 120° F. Don't rinse.

5. Drop the bath and finish as desired.

Finishing—Fabrics of Orlon Type 44 with Orlon Type 42 can be handled in finishing in the same manner as comparable material of 100 per cent Orlon Type 42. Dryers, steam calenders, post-boarding equipment, and the like are run under the same conditions as for Orlon Type 42. Usual finishing precautions for fabric of Orlon apply.

For sweaters:

1. Tumble drying under relaxed conditions at 180° to 220° F. followed by tumbling while cooling.

2. No mechanical pressure on the goods during pressing.

3. No steaming of waistbands.

For socks:

1. Same precautions for tumble drying.

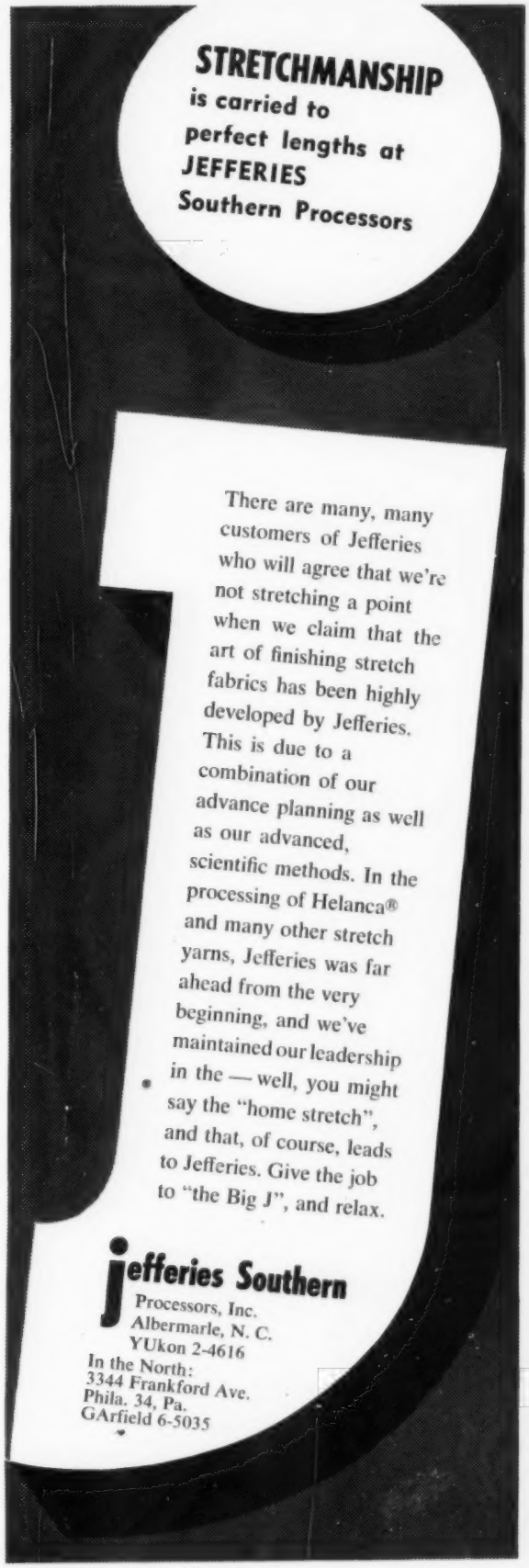
2. Post-boarding on cool boards—maximum temperature 225° F.

Tinting—One means of segregating different fibers in a spinning plant is the use of fugitive tints during fiber processing. A line of fugitive tints suitable for use on either Orlon Type 44 acrylic fiber or Orlon Type 42 has been recommended by the Du Pont Laboratories. These tints can be removed easily by a simple 120° F. scour, and can be applied to Orlon Type 42 prior to Turbo fiber-setting. They may not be used on Orlon Type 44 prior to fiber-setting. Since fiber processing conditions will vary from mill to mill, any concern contemplating use of these tints on Orlon Type 44 or Orlon Type 42 should thoroughly satisfy itself through testing of small amounts of goods that such tints are suitable for the processing operation, before committing them to use in large-scale production. A list of these tints is shown on Table I. (See Page 19)

New Flame Retardant Introduced By Crest

NEWARK, N. J.—A flame-retarding agent based on an orango-phosphate compound has been introduced by Crest Chemical Corp., here. The product, designated Pyrocrest, is a water soluble water-white clear liquid of low viscosity. It is claimed to possess remarkable ability to stop flaming and smouldering or glowing after the source of the flame is removed.

Pyrocrest will not cause effervescence or salt blown on ageing when used on fabric and it imports a soft hand. It also has penetrating properties to assist in the impregnation of the material being treated.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Dyeing & Finishing

JET tentering and drying machine for tricot. Bruckner Machinery Corp. Sales agent for Trockentechnik Kurt Bruechner K.G. Leonberg, Germany, has set up a demonstration model of this machine at its headquarters in Cedar Grove, N. J.

This unit consists of a pin-frame with a one foot gas fired housing and has all the modern attachments for the efficient handling of tricot. The entrance side of the frame is equipped with two scray rolls, selvedge uncurlers with rotating spindles, and overfeed device with individual adjustment for each rail. Latter permits additional tension control. The coordinated action of all these devices uncurls the fabric completely and pinning takes place while the fabric is in the completely uncurled state. Pinning is said to be exteremely precise with a very narrow seldedge.

An ingenious selvedge unpinning, cutting, and trim disposal device is installed at the take-off side of the frame. The fabric is taken out of the pins by a depinning wheel and the selvedge is cut in this position by rotating knifes. The narrow trim is then exhausted into a storage bin by means of suction hoses.

The housing is of the walk-in type, permitting easy access and maintenance of all parts inside the oven. The overall construction is very rugged assuring care-free operation of the machine.

Bruechkner also builds open frames for batching prior to dyeing and for bringing fabrics back to even width. Dryers for tubular fabrics and auxiliray machines for the finishing of tubular fabrics are also available from Bruckner.

Legislation Passed To Aid Pa. Dyers

PHILADELPHIA, Pa. — Legislation which will provide tax relief for dyeing and finishing firms here, has been passed by the State Senate in Harrisburg. It calls for the expansion of sales tax exemptions in the manufacturing field.

At the same time the Senate approved a bill to abolish the two per cent commission paid retailers for collecting the State sales tax which would make up for the revenue lost on the dyeing and finishing bill. Both bills have been passed by the House and await the Governor's signature.

Provisions of the bill to aid dye finish firms show the meaning of the word "manufacturing" has been extended to include the throwing, twisting or winding of natural or synthetic fibers, or spinning, bleaching, dyeing, printing or finishing of yarns or fabrics when such activities are performed prior to sale to the ultimate consumer.

The bill, retroactive to March 7, 1956, provides for reimbursement to firms for taxes paid since that time. It also will clear any litigation in the courts concerning sales taxes.

Philadelphia firms see the bill as a savings of $100,000 in back taxes and an annual saving of $20-$25,000. The industry points out that dye-finish firms have had a rough time for the last several years and described the legislation as important to continuance of the industry.

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A tricky business, wool shrinkage control? Yes indeed, but we don't shrink from its problems. Our staff knows exactly how to handle them to create the proper results every time. In Fur Blend Finishing, our advanced methods and careful control make the difference between an ordinary garment and one that glows with luxuriant softness; has delicate, even color and a hand that brings out the most desirable qualities of the fur. Give the job to "the Big J", and relax.

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Meetings

Canadian Seminar Scheduled Sept. 5-7

WESTMOUNT, Montreal—Plans for the Eighth Canadian Textile Seminar, major biennial project of The Textile Technical Federation of Canada, are proceeding apace, under the direction of H. C. Mersereau, Canadian Celanese Limited, Montreal, Que., newly appointed general chairman.

The Seminar is divided into five sections: conversion of fibers into yarns; conversion of fibers and yarns into fabrics; dyeing and finishing; mill supervision, and knitted fabrics.

Held biennially since 1948 at Quen's University, Kingston, Ont., the Eighth Seminar will be held September 5, 6 and 7, 1962, with registration taking place on the evening of September 5. Seminar sessions will be conductd morning and afternoon on Thursday and Friday, September 6 and 7.

A departure from past procedure will be the Federation luncheon, scheduled for September 6, at which the keynote address will be delivered and the Federation's Meritorious Service Award will be presented. Chairman of the Thursday luncheon will be A. Harold Miller, president, The Textile Federation of Canada. A prominent world textile authority will deliver the keynote address.

A total of 24 papers will be delivered by noted textile scientists and technologists and will be pre-printed in the Seminar Book of Papers, which will be distributed to registrants on registration night.

Hartford Fibres Official Talks Sept. 6 on Zantrel

Dr. C. Eugene Coke, director of research and development, Hartford Fibres Company, will speak on Zantrel polynosic fiber at a dinner meeting of the American Association for Textile Technology September 6 at the Hotel Vanderbilt.

The meeting will begin with a social hour at 5:30 P.M. Dinner will be at 6:30, followed by the speech and discussion.

Zantrel has applications in a wide variety of apparel items, including knitted outerwear.

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RETAILER

Wool builds prestige because it spells quality, richness and full value received. Customers do not have to be educated on wool qualities; they are never confused. Wool satisfies; satisfied customers mean more business on a better mark-up.

KNITTER

Wool has no handling problems; works through machines with ease; never varies in its natural quality. Wool has a softness that enhances richness and texture of knitted fabrics.

SPINNER

No time or money wasted in trial and error when working with wool . . . can be handled without special controls. Wool runs better on machines. It is always reliable; its performance is proven.

DYER

Wool is less costly to dye; dyeing is easier, doesn't require special machinery. Wool is easier to wind. Wool takes the widest range of shades, with no color-matching difficulties.

Walter Daniel

Men's Wear

Revere Unveils Sweater, Shirt Line Sept. 6-8

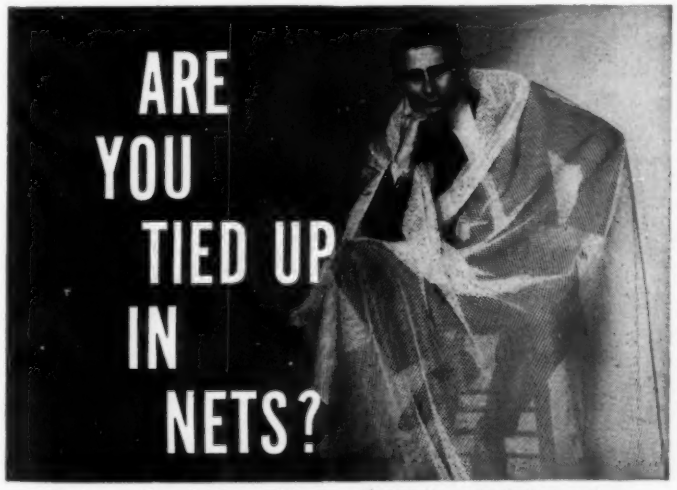
WAKEFIELD, Mass. — Revere Sportswear's presentation of the new spring line to sales personnel will again take place at Nevele Inn, Ellenville, N. Y., September 6-8, about a week earlier than a year ago. Knit shirts will comprise the major part of the 70 styles selected. Joel Gordon, vice-president, said the accent is on fibers and colors and that item business is anticipated for the new season.

There are to be more knit shirts buttoning down all the way to give a dressier look. Much more of the fine, lightweight shirts are planned. The firm sees a resurgence of Orlon sweater-shirt sets.

Revere planners also anticipate less interest in boatnecks and a big season for placket models with perhaps greater emphasis on the freedom neckline and convertibles. In line with this thought, the firm is introducing a set of Henley collar treatments, associated with rowing and yachting, that are also excellent for casual and lounging wear.

Revere's new collection goes in for bright orange, greens, blues and the lilac shades for accentuating patterns but the solids tend toward pastels ranging from brights to the softer tones. A good example of this theme is the application of orange which appears bright to enliven patterns and in more subdued variations in the solids. Lots of vertical stripes are used for spring particularly in the sweater shirts and the two-tone effect work out excellently for combination treatment.

A minute-man promotion is planned for the company's Paul Revere symbol worked out on a series in embroidery. Embroidery is used extensively for chest designs and there is also a new modern futurama abstract shirt symbol embroidered in two-ply lisle. Appliques are also used but not to the extent of the embroidered work.



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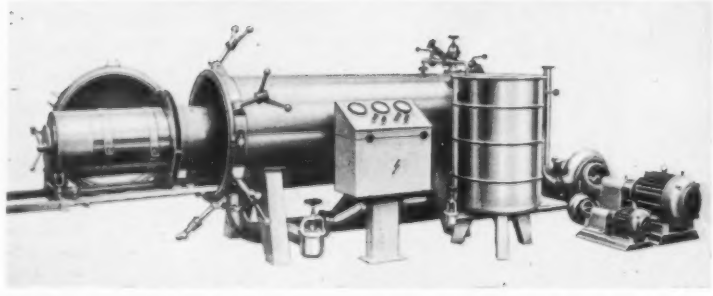

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Knitwear Abroad

Poor Summer Mars Scottish Mills' Outlook

GLASGOW, Scotland (Via Scottish Amalgamated Trade News Agency) — Scottish knitwear firms have had a bad season, along with other sections of the fashion trade. Cold, wet weather has discouraged discarding of coats and purchase of summer frocks with appropriate knitwear. Stocks have accumulated and there will have to be substantial end-of-season clearances before the shelves are ready for autumn stock. Even so the prospects of buying are far from happy, since buyers will probably play very safe.

Where previously knitwear houses could urge advance ordering and advance buying, creating a market in advance, more and more of the buyers are waiting for money and for approval for buying sessions. A great many will play the market and take what is on offer rather than commit themselves ahead, in view of the present season's experience and the tightening of finance.

Prefer To Wait

Added fact is that very few of the buyers are sure of themselves now and will prefer to wait and see rather than commit themselves to a given line of action. One point which emerges here is that the quality of buyership appears to have deteriorated, if knitwear men are a reliable guide to the position. Where, previously, buying was done by people who knew knitwear—its construction, its qualities and its values—the present generation of buyers are more concerned to capture a market and lack the knowledge to assess the materials they are buying. This obviously is not a criticism of all buyers; there are still buyers who know what they are seeking and what they are buying; but too many are uninformed on the technicalities of knitwear and are buying "gimmicks" rather than knitwear. Or so the knitting firms state.

These buyers cannot guide their manufacturers since they themselves do not know what they want. They buy as and when the market seems to suggest that this or that will sell, and no longer dictate in advance what they really want. That leaves the burden of selection of the appropriate "gimmick" on the knitter, who is as much in the dark as the buyers since he cannot say in advance what the new season's winners will be. Even when he does discover that he has a winner on his hands, little can be done about it, since the time lag of six to eight weeks necessary for reordering of the favored style, knit or color could well mean that the "gimmick" has lost its potency by the time the repeat orders are produced and available.

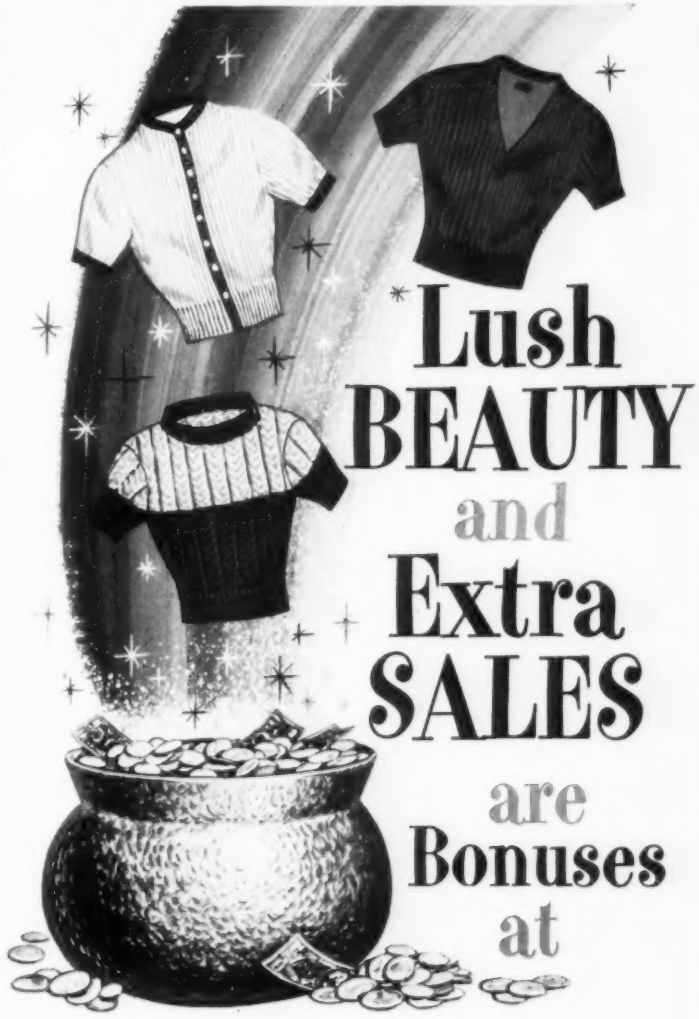
Tight Money Problem

Another problem is that money is much tighter than at any time for years. Retailers have been slower in clearing their bills and this has had the effect of slowing down activity all round. The present financial situation is far from reassuring and that will have the further effect of creating delayed payments so that knitwear manufacturers have an added problem of financing production on their hands.

They have to face the new season with this dual problem of tighter money and uncertainty of fashion trends, particularly in the teenage trade where the element of "gimmickry" is of major importance. Unless the manufacturer guesses correctly—and it is only a guess, at the best—he could find himself with a great deal of stock on his hands and no market. Hence the decision by most firms in the teenage fashion end to move with maximum caution. It is clear that there will be plenty of stock around, that buyers will be able to play one supplier against the other, and that the orders will be slow to come in. It is equally clear that money will be slow as well and that the new ranges will have to compete with the remaining spring and summer stocks. They will also have to face the cut price clearances which now seem inevitable.

Frank Koday Co. Moves

Offices of Frank Koday Co., sweater and sportswear mill representatives to the wholesale trade, are now located in suite 2205-7, Sheraton Atlantic Hotel, Broadway and 34th Street. The company's offices were previously at 112 West 34th St.



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Orlon processed by the Turbo-Stapler provides the properties you want for laminated knits. Its uniform fiber distribution and improved spinnability makes a 80/20 ORLON/WOOL blend with excellent cover and fabric breathability.

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Swimwear

Portland Stores Enjoyed Good Sales; Prices Were Maintained Into August

By VIRGINIA CORNING

PORTLAND, Ore. — A clinging shape; a very low back, fitting snugly to the form; a lightweight fabric; a print that's somewhat out of the ordinary; and, very often, a vibrant color combination—these are attributes of the swimwear sought by feminine customers in stores here this summer.

Portland enjoyed, all in all, a good swimwear year—not one of skyrocketing sales, but rather a season of quite steady business which, by the end of july, gave promise of exceeding last year's.

"We do our biggest business here in July—and we don't want our prices broken before August," said one important buyer. At least a few suits are carried practically the year round in the larger stores here, as a matter of fact; and it seems probable that swimwear is gradually becoming much more of an all-season business than in the past.

Certainly displays and promotions are spaced out over a much longer period than was once the case. Liberal use of window space began early and continued right through the spring and summer seasons, with nearly all stores participating.

Price Unchanged

Prices on which the major volume was centered appeared to be about the same as last year for identical stores and departments. Buyers continue to comment on the complete absence of any price resistance at all, whenever the customer is able to find a suit she particularly likes.

Today's customer wants something different and is willing to pay for it. Fewer of the conventionally styled, less expensive types are sold.

One buyer said that 80 per cent of the swim suits are bought by young girls—and "they just won't buy cheap suits —they'd rather pay $20 or $25 to get what they want."

For large departments which stock prominent brand name lines, volume lay mainly in the $15 to $25 range.

Prints were cited as enjoying a much greater popularity than last year, and buyers were enthusiastic about the "terrific job" done by manufacturers in creating beautiful and unusual prints for this year's market. Many types were mentioned; but the exotic or glamorous ones seemed particularly favored. Jungle or Hawaiian numbers were described as especially good.

Color Palette

Some said oranges and bright yellows did well — including combinations of the two colors. A blue-green-purple jungle print was another successful combination. Among the more unusual colors, purples have been very good.

Glamor and enchantment were sought also in the beautiful, quite realistically drawn floral prints which proved extremely popular this past season.

Frequently mentioned was the big Jantzen reorder number, Rosy Glow, in woven elasticized material, with its romantic bunch of posies placed at the midriff, and smaller rose designs spaced elsewhere on the suit in random manner. It retailed at $19.95. Accompanying this sheath was a tempting selection of matching accessories —a hat, a beach towel, a beach bag and a parasol.

At least one buyer felt that it was the suit which sold the accessories, rather than the accessories that sold the suit, but it's probable that each benefitted reciprocally.

Towels and swim accessories of all kinds were pushed harder by stores this year, and buyers said they sold well, as did coordinating garments, such as skirts; but the big share of this type of business was chalked up in the early season. Summer shopping was mostly for suits alone.

(*Continued on Page* 65)

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*DuPont's Acrylic Fiber

Another favorite floral mentioned was Jantzen's colorful lilac-and-poppy print — Poppy Love — in elasticized cotton knit at $17.95. Matching accessories were available for this style also.

Abstract prints were good. There was some difference of opinion among buyers, concerning stripes. Some said they were "still good," while other comment suggested that they are "slipping."

Perhaps somewhat more interest was shown in patterns that suggested a stripe, rather than the out-and-out stripe which was so favored recently.

Fabric Preferences

While fabric has been very important this season, buyers continue to say that customer preference is not so much in terms of some particular fiber as in the flattering appearance and the ease and comfort the fabric contributes.

Knitted and woven elasticized materials are enjoying great importance because "most women want something that grips the figure."

The new lightweight Lycra and Vyrene elastomers were, at least potentially, the stars of the season. Seemingly their only drawback lay in the fact that there just weren't enough of them obtainable. Rose Marie Reid suits of this kind sold out immediately at $35 in one large store.

Knits were variously viewed by buyers and merchandise managers. Some find their popularity about the same as last year's, while others say it is increasing steadily. One buyer feels that interest in knits is decreasing because of lack of something new in styling.

Weight or bulkiness of appearance in knit suits, or too much water absorption, are considered highly undesirable. For this reason, textured knits are regarded with some reserve; the "light look", rather than a heavy "wintry" appearance, is desired.

Cotton, both in woven and knits, suffered a decrease in interest, particularly the woven cottons.

The fashion world's projected

(*Continued on Page* 67)

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movement toward the covered-up look in swimwear has aroused little enthusiasm here. As one big-store buyer put it, even the high-style suits of this type aren't bought except by those who "have something to hide." Nor did this rather withering comment refer just to a poor figure. It would more likely be something like a surgical scar, a further explanation revealed.

The low, low back is mentioned without exception as one of the big things this year. "Good fit and a low back make for good sales," said one buyer.

Popularity for the maillot style continued to increase somewhat, particularly for the young girl. The boy leg and the sheath were important. The half-skirt was mentioned as being an important seller.

Statements of buyers on progress of the two-piece suit were rather inconclusive—"about the same" . .. "not as important as last year."

At the Bedell's, a major women's specialty store, the two-piece, and even the bikini, were reported doing quite well.

Buyer Frank Nylander's cryptic comment was: "They say Portlanders won't buy bikinis, so I guess these customers must be 'outside' people!" He mentioned the increase in private pools as a reason for this type of sales.

The French bra cups and other figure-molding devices are now virtually standard, as nearly all women either want or require the additional allure they provide.

A, B and C cup interest has practically vanished, since suits for the larger person are generally designed to accommodate the larger bust. Few sizes above 16 are sold, in any event.

Jack Shane Named As R-M-R Regional Manager

LOS ANGELES, Calif. — Jack Shane has been elevated to Southwestern regional manager for Rose Marie Reid.

A veteran of more than 20 years in the textile, design, and apparel fields, Shane was formerly assistant Western regional manager for Rose Marie Reid. He has been with the company for more than seven years.

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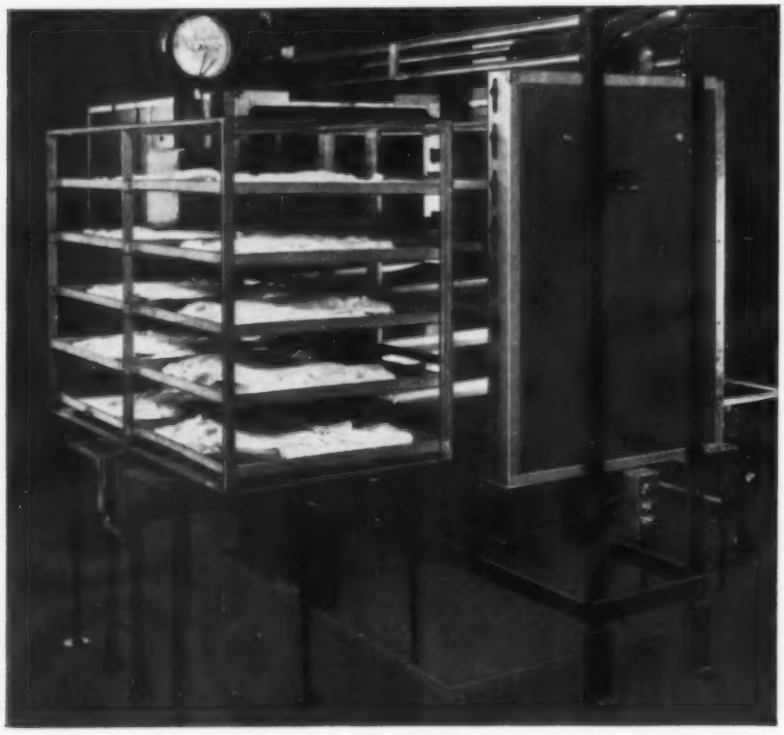

for sweaters . . .

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Turbo Sweater Setters use a combination of pressure and vacuum to help you achieve dimensional stability in the fabric. Additional advantages are improved hand, increased smoothness of fabric and improved dyeing properties.

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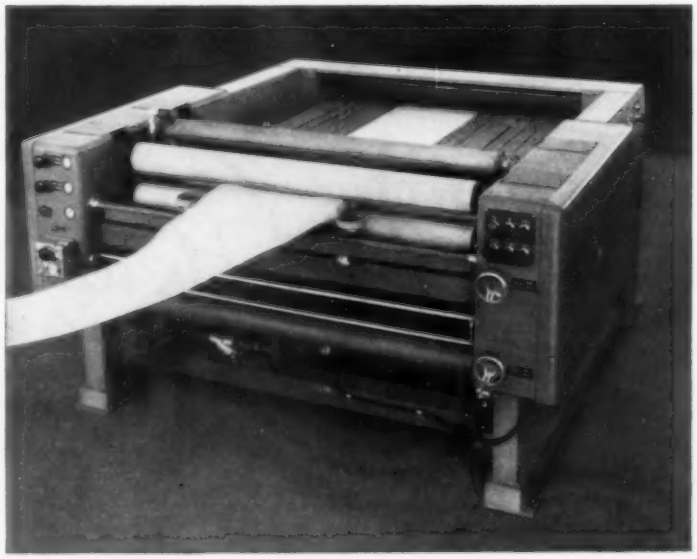
Tubular fabrics can be stretched, steamed, pressed, then neatly rolled or folded at speeds up to 60 yards per minute on the new Turbo Finisher.

A patented spreading-feeding mechanism is used in combination with a fabric tensioning control which is attached to the press rolls. Nip pressures can be varied to handle fabrics of any thickness, including heavy thermal fabrics. Single, double and triple ends can be finished simultaneously. Maximum single width is 64 inches.

Dimensions: 51″ high, 97½″ wide, 150″ long. Occupies approximately 110 sq. ft. of floor space. Weighs approximately 2000 lbs. Bulletin on request.

TURBO FINISHER FOR TUBULAR KNITS



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Mill News

Manchester Fashions Opens Mill Outlet Store

MANCHESTER, N. H.—A new mill outlet store has been opened at Manchester Knitted Fashions, Inc. The management describes it as having the largest selection of sportswear, knitted shirts and sweaters in New Hampshire.

The store, at the corner of Turner and Foundry Streets, on the west side, will be open from 10 a.m. to 9 p.m., Monday, Tuesday, Wednesday and Saturday, and 10 a.m. to 10 p.m., Thursday and Friday.

Flagg-Utica Will Run Merit Underwear Co.

SHOEMAKERSVILLE, Pa. — Merit Underwear Company, manufacturers of knitted outerwear, athletic shirts and briefs, will be operated as a division of Flagg-Utica Corporation, it has been announced.

Merit employs more than 200. It has operated here for the past 48 years.

J. E. Vilagi, financial vice president of Flagg-Utica said, "Merit will be a great adjunct to our merchandising program and ally us with a highly regarded firm in the knitted underwear and outerwear field."

Merit will continue under the present management and will expand production.

* * *

Thomas J. Fontana has been elected secretary of Flagg-Utica Corporation.

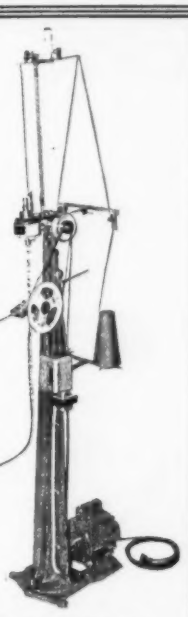
He was with Cravath, Swaine & Moore from 1950 to 1960. For the past year he has been an attache of the Appellate Division of the New York State Supreme Court.

New Firm In South Has Speizman Machines

CHARLOTTE, N. C. — A new hosiery mill, the Gold Seal Manufacturing Company, has started operations with 400 needle seamless machines purchased from the Morris Speizman Company, Inc., machinery dealers here.

E. Baicowitz and Joseph Percal are co-owners of Gold Seal.

THE AINSLIE String MACHINE



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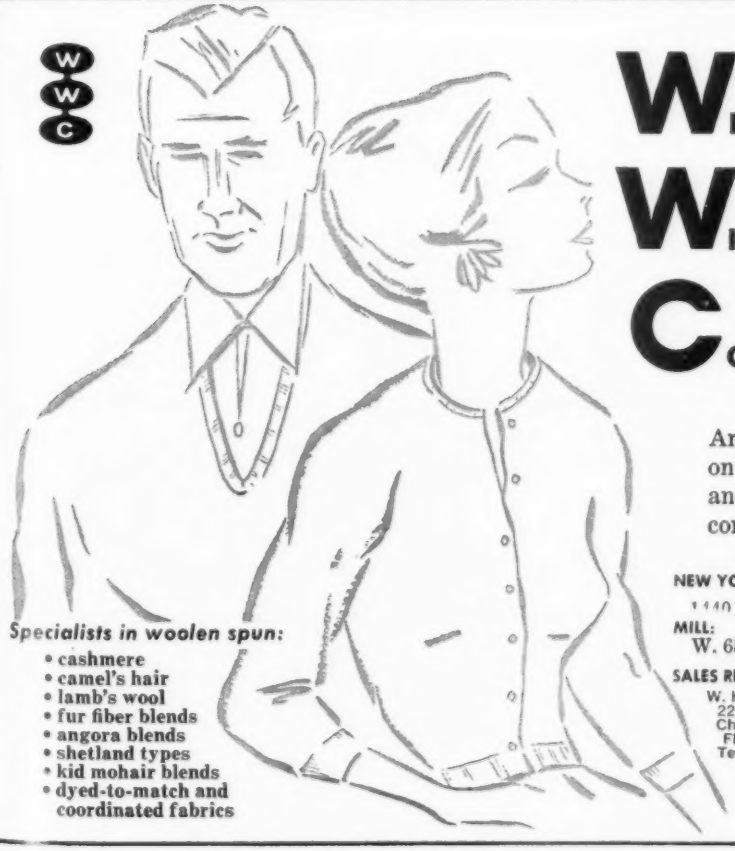

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Mill News

Austin Knitting Adds 24,352 Square Feet

ALBEMARLE, N. C.—Austin Knitting Mills, Inc., has announced an addition of 24,352 square feet to their plant for production and shipping. The addition will be one story brick and air conditioned.

The firm's full fashioned sweaters are sold throughout the U. S. With Enfield Manufacturing Company, manufacturers of high styled skirts, it maintains a sales force for a general line of sportswear and sweaters coordinated in color, with a New York City office at 1410 Broadway, under the name, Austin Joel Casuals.

Troy Mills Inaugurates Apparel Fabrics Division

TROY, N. H.—A new apparel fabrics division for woolens, worsteds, synthetics and blends has been established by Troy Mills, Inc.

The fabrics will be for sportswear, women's wear, children's wear, men's wear and outerwear. Julian Waldman, newly-appointed division manager will be in charge of the operation. He was formerly associated with Schuster Woolens, Inc., New York City.

Koret Establishes Local Office To Buy Fabrics

SAN FRANCISCO, Calif.—Koret of California has opened its own fabric buying office in New York City.

"The substantial growth of our business necessitates the establishment of our own New York buying office," stated Joseph Koret, president. "Our new buying facilities will enable us to expand our program of developing exclusive fabrics for our sportswear and also to offer our customers an even wider range of fine market fabrics."

Peter W. Oppenheimer has been named to head the fabric buying office, which will be located in the company's New York headquarters at 1407 Broadway.

Oppenheimer, a graduate of the University of Virginia, was formerly associated with Burlington Industries in the Burlington Greige Sales Division. Before joining Burlington in 1958, he was associated with Brand and Oppenheimer.

Mauer Associates will continue as merchandising consultants for the company.

Edita Kertis, Designer, Forms Her Own Studio

Edita Kertis has resigned as designer for Bernhard Altmann to form her own studio in New York City.

Prior to joining Bernhard Altmann in 1948, she was a designer for Dalton, Inc., Cleveland.

Liebster And Soowal On Globe-Circling Tour

PHILADELPHIA, Pa. — A. H. Liebster, M & M Knitting Mills, and Morris Soowal, Jacquard Knitwear Mills, will leave August 30 for a visit to Japan and Hong Kong to view the import situation.

They will go on from there to India, Israel and Italy, where they will look for style ideas. They will return home about October 28. Both will be accompanied by their wives.

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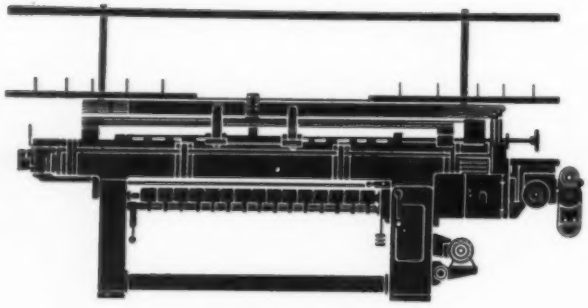

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Mill News

Straus Knitting Mills Names Samuel Marcus

ST. PAUL, Minn.—Samuel M. Marcus has been appointed Missouri sales representative for the knit trimming line of Straus Knitting Mills, Inc. here.

Mr. Marcus succeeds Ray P. Lewis, who has retired. Mr. Marcus' headquarters will be at 1000 Washington Avenue, St. Louis, Missouri.

E. H. Braun, Of Tony Day, Returns From Europe

WATERLOO, Ontario — E. H. Braun, plant superintendent of Tony Day Sweaters has returned from a month long tour of European knitting mills. His trip included visits to plants in Nurenberg, Munich, Schaffhausen, Lunenberg and Zurich. Of particular interest, he said, was a visit to the Lucia mills, producers of ladies' and men's sweaters.

Regal Items In Two-Page American Weekly Spread

Regal Knitwear Co., Inc., had a two-page center spread editorial in Sunday's American Weekly, the Hearst paper magazine section with a circulation of ten million.

Major department stores in key cities, including New York City, Los Angeles, Philadelphia and Baltimore, have display windows and other tie-in promotions. One store has been running banners in its local advertising, advising the consumer to watch for the Sunday supplement.

DuPont is planning a follow-up mailing piece.

Factoring

Talcott Declares Dividend Of 22½c Per Share

James Talcott, Inc., has declared a dividend of 22½ cents per share on the common stock of the company. The dividend, payable on October 2, 1961, to stockholders of record September 15, 1961, equals that of the previous quarter.

The latest dividend, the second since the two-for-one stock split last April, is equivalent to 45 cents on the pre-split shares. In quarters prior to the split, Talcott had paid 45 cents per share.

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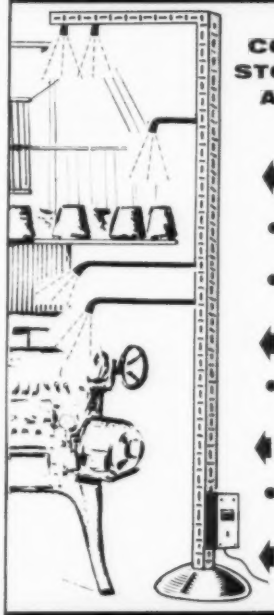

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IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD., MONTREAL

Cotton

Mill Consumption Gain Expected

WASHINGTON, D. C.—Consumption by U. S. mills in the 1961-62 marketing year is expected to total about 8¾ million bales, according to the Economic Research Service, U.S. Department of Agriculture. This estimate, the Service said, assumes that exports of cotton textiles will about balance imports of cotton textiles and picker laps. If imports of textiles and picker laps are larger than exports of textiles, mill consumption will be smaller, but domestic consumption will still be at the level indicated above. Consumption this season is estimated at 8.2 million bales.

Reasons For Increase

Factors which are causing the increase in consumption are rising consumer income and a decline in the ratio of stocks to unfilled orders for cotton broadwoven goods at mills over the past few months. Personal disposable income per capita in the United States has been rising for the past several months and the increase is expected to continue into the future. The stock-unfilled order ratio declined from December 1960 to March 1961 and remained about at the March level in April and May. A decline in the ratio usually indicates an increase in future mill consumption of cotton.

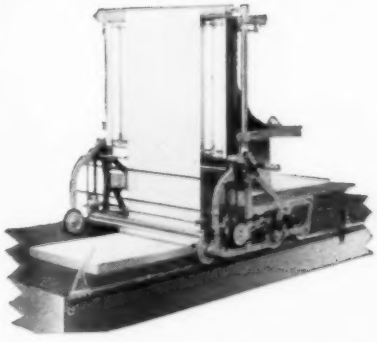
Negative Factors

Cotton consumption might rise further, the Service noted, if there were not some negative factors in the picutre. The principal one is an expected increase in U.S. man-made fiber consumption. The cotton equivalent of the non-cellulosic man-made fiber domestic consumption per capita probably will increase. Larger consumption of the non-cellulosic man-made fibers tends to depress the level of cotton consumption. The cotton equivalent of the consumption of non-cellulosic man-made fibers in 1961-62 may be about 25 per cent larger than in the current season.

Since January 1961 when the average price for Middling one-inch reached a low of 30.14 cents per pound, the spot market

(*Continued on Page* 77)

UTICA *Hand Laying Up Machine for* TUBULAR KNITTED FABRICS



Here's a machine that lays up several times the amount that can be done by hand — and you don't need an expert to operate it. This new lightweight model piles cloth up to 7" high—standard machines 26", 32", 38" and 44" width rolls . . . and others to order.

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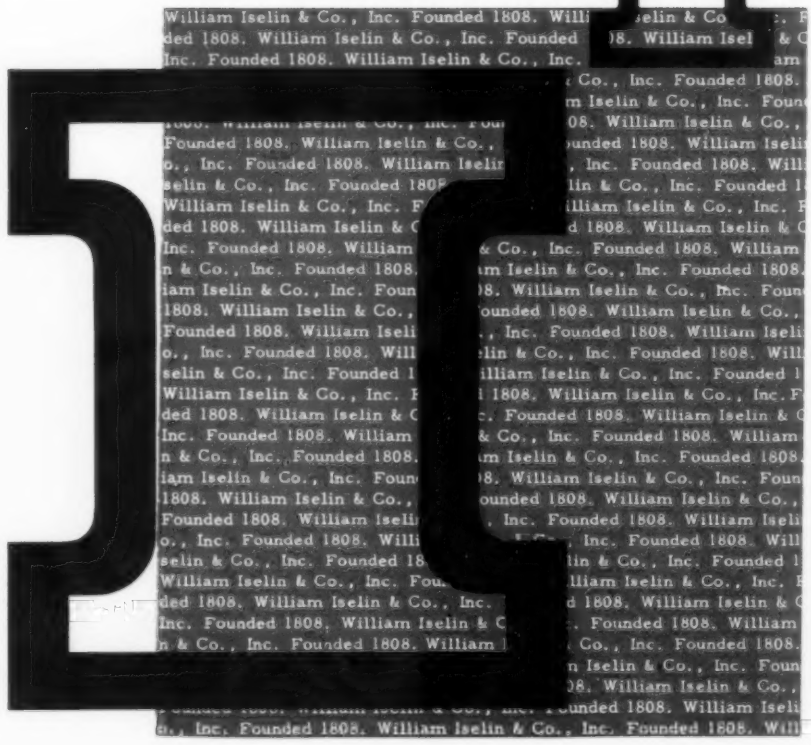

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price has been moving upward. The June price averaged 32.22 cents per pound. However, the monthly average spot market price for Middling one-inch cotton from August 1960 through June 1961 was about a cent a pound below the average for the same months a year earlier.

The lower market prices during 1960-61 compared to 1959-60 reflect lower support levels. The support price for Choice A Middling one-inch cotton at average location for 1960 crop cotton was 32.42 cents per pound, compared to 34.10 cents per pound for the 1959 crop cotton. For the 1961 crop, the support price for Middling one-inch cotton at average location has been announced at a minimum of 33.04 cents per pound.

Knit Paper

Whitin Machine License To Research Paper Yarn

WHITINSVILLE, Mass. — The Whitin Machine Works, which for many years has manufactured an extensive line of twisters of all kinds for cotton, wool, worsted, synthetics, glass and paper, has been licensed by Roland H. Marks, president of Enterprise, Inc., of Dallas, Tex., to conduct research and development on the Marks system for the splitting and twisting of paper and other materials.

J. Hugh Bolton, president of the Whitin firm, said the concept of mounting a slitter on a twister to permit twisting of finer yarns from paper or other sheet-form materials has recently been made more feasible through developments by Mr. Marks and his Dallas company.

"The licensing of Whitin for experimental use of the Marks process," Mr. Bolton explained, "will open the way for us to apply our substantial research and development facilities to the further development of slitted and twisted materials and end products."

Errata

American Fabrics Motifs

Three children's motifs of American Fabrics—a fish, lamb and dog—were erroneously attributed to another firm in the Ribbons, Buttons and Trimmings issue (August 14) of the KNITTED OUTERWEAR TIMES.

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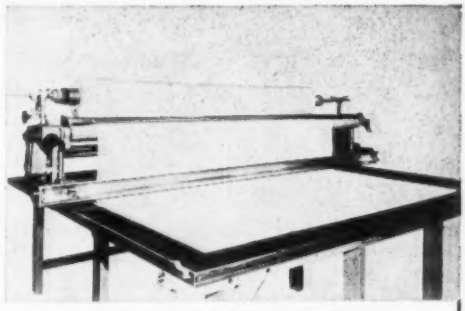

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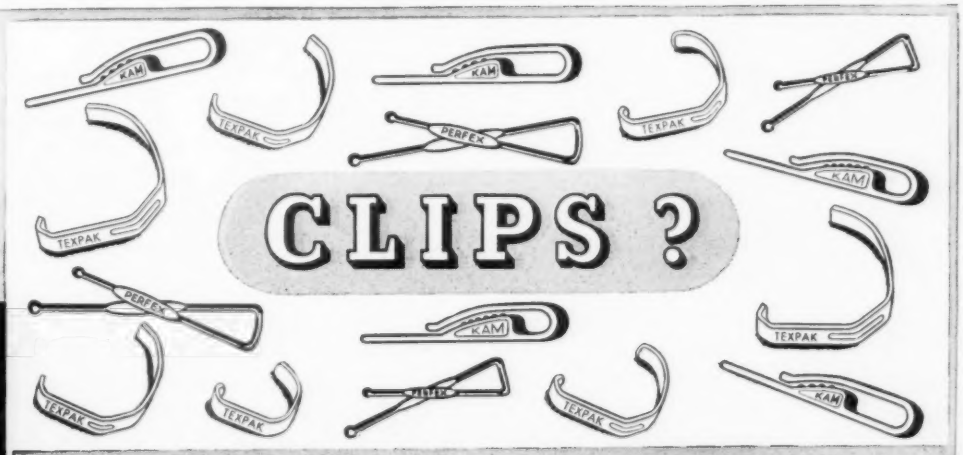

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Synthetic Fibers

Swedish Acrylic Promoted Abroad

STOCKHOLM, Sweden — Recent reports suggest that Tacryl, an acrylic fiber produced in comparatively small quantities for some years by the Swedish company, Stockholms Superfosfat Fabrik AB, will now be promoted more powerfully in the European consumer market.

In the past, Tacryl was generally considered to be more suitable for industrial uses. Its characteristics, unusual for an acrylic, made it particularly suitable for papermakers' felts. But recently a modified type of the fiber has been developed. The original type has been named Tacryl A, and is described as having extremely good wet-hot properties for technical applications. The new type is called Tacryl N and combines the good wet-hot properties of the original fiber with very good dyeability.

Wet Spun Fiber

Tacryl is wet spun from a dimethylformamide solution into aliphatic kerosene of high boiling point as coagulant, and is then oriented. This coagulation process produces on the fiber a surface which gives good resistance to soiling and high friction.

At the moment Tacryl is produced in staple form only, but it is reported that samples of high tenacity continuous filament have been made for test purposes.

In color, Tacryl is creamy white. The modified type, Tacryl N, is produced as semi-dull and bright, with an elliptical cross-section. Its skin is smooth, yet crinkled. The lower deniers of fiber (3 to 6 denier) of Tacryl N are supplied with about ten crimps to the inch; higher deniers (9 denier, for example) have about nine crimps to the inch. This crimp, it is claimed, is permanent and unaffected by boiling or stretching which occurs in processing.

The specific gravity of Tacryl N is 1.10. Its tensile strength is about 2.5 to 3.5 grams per denier when wet at 21 C. Elongation at break varies between 27 and 38 per cent when wet at 21°C. At 90°C, this becomes 70 per cent. Torsional and flex fatigue resistance is said to be very good but not as good as polyamides.

Wear strength, again not quite as good as a polyamide fiber, is claimed to be double or treble that of wool. Moisture regain at 21°C is 1.2 per cent. Shrinkage at the boil is zero.

Tacryl has no melting point but decomposes depending on high temperature and time factors. An important feature is said to be its second order of transition temperature, 85°C.

Varied Denier

The fiber is offered in staple lengths and deniers suitable for spinning on the worsted, woolen, cotton and flax systems. The new modified fiber is produced as a regular shrink-resisting grade and as a high shrinkage grade which shrinks about 16 per cent at the boil. This latter grade, marketed as Tacryl NS, is used to achieve high-bulk fiber blends.

Owing to its high friction and excellent dimensional stability, this acrylic fiber is particularly useful for jersey fabrics. The producers recommend 2 and 3 denier fiber for this application. When extra softness is required, yarn spun from a mixture of normal and high bulk Tacryl is most suitable.

Tacryl can be blended with wool for jersey fabrics. For this, a blend containing 40 per cent Tacryl is said to be optimum.

More Resilient

Stockholm Superfosfat Fabriks AB stress that their fiber has a somewhat stiffer, harder and more resilient character than most other acrylics. This produces a handle less like the cashmere-touch associated with some fabrics produced in acrylic fibers. For particularly soft and bulky knitwear, again the standard and high shrink blend of Tacryl yarn is recommended.

The fiber producers list the specific advantages of Tacryl in knitwear as producing high bulk and permanent crimp, warmth and comfort (owing to the fiber's moisture conditioning capacity), very good dimension stability (even during washing), excellent shape retention during wear, high and permanent resilience, high resistance to abrasion and soiling, durable antistatic finish, and a low pilling tendency combined with good texture retention.

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Synthetic Fibers

Luttge And Smith Promoted By Chemstrand

The Chemstrand Corporation has promoted two executives. They are:

William G. Luttge, vice president, marketing, to senior vice president and assistant to president, responsible for evaluation of markets for the products of the corporation. He will represent the president with affiliated companies, major customers and maintain contact with business and industrial associations.

Robert E. Smith, general manager, marketing, to vice president and general manager, marketing, responsible for marketing of the corporation's products.

* * *

Theodor V. Shumeyko has been appointed director, public relations, of the Chemstrand corporation, Robert M. Crooks, executive director, industrial and public relations, announced recently.

Shumeyko joined Chemstrand in February, 1957, as product information coordinator. He was promoted to product information manager in March 1958 and public relations manager in May, 1961.

Prior to joining Chemistrand, Shumeyko was vice president of Melva Chesrown, Inc., public relations consultants.

He is a member of the Public Relations Society of America, chairman of the Public Relations Committee of the Resources Council of the American Institute of Interior Designers.

Dow Reduces Price Of 1100 White Rovana

Dow Chemical Company, has reduced the price of 1100 denier white Rovana from $1.15 to $.95 per pound. The other colors in 1100 denier will remain at $1.20 per pound.

End uses for the fiber include draperies, shoes, millinery, handbags, placemats, auto seat covers, upholstery, automotive fabrics, grille cloths, outdoor fabrics and luggage.

Obituaries

Charles B. Dearnley, 69, Headed Yarn Spinners

PHILADELPHIA, Pa. — Services were held August 22 for Charles E. Dearnley, president of Dearnley Bros. Worsted Spinning Co. and Chelten Dye Works, here. He was 69.

Mr. Dearnley was a past director of the National Association of Wool Manufacturers and of the Philadelphia Textile Manufacturers Association. He was a life member of the board of managers of Memorial Hospital, here; board chairman of the Theodore Presser Music Publishing Co., and active in Rotary.

Mrs. Sadye Brustein, Widow Of Yarn Maker

Services were held August 15 for Sadye Brustein, wife of the late Joseph Brustein, who was one of the principals of S. Brustein Co., yarn producers.

Survivors include two daughters, Mrs. Evelyn Golden and Mrs. Yvonne Anderson; a sister Pearl Posin, and five grandchildren.

Sidney Cohen, 59; Was Cover Designer

PHILADELPHIA, Pa. — Services were held August 20 for Sidney Cohen, a designer for Clover Knitting Mills. He was 59. Before joining Clover, Mr. Cohen had been with London Knitting Mills.

Knit Laminates

Adhesive Is Improved For Foam Lamination

CAMDEN, N. J. — Two major improvements in its non-solvent adhesive for laminating polyurethane foam to knitted and woven fabrics are announced by Manufacturrs Chemical Co. here.

The adhesive, Maniflex 789, has been strengthened by the addition of a safety factor to assure maintenance of hand. The other improvement relates to improved launderability.

The price of Maniflex 789 has been reduced six per cent.

Laminated Knits Reprints

Reprints of the Laminated Knits issue of the Knitted Outerwear Times (June 26) are available at $.50 a copy.

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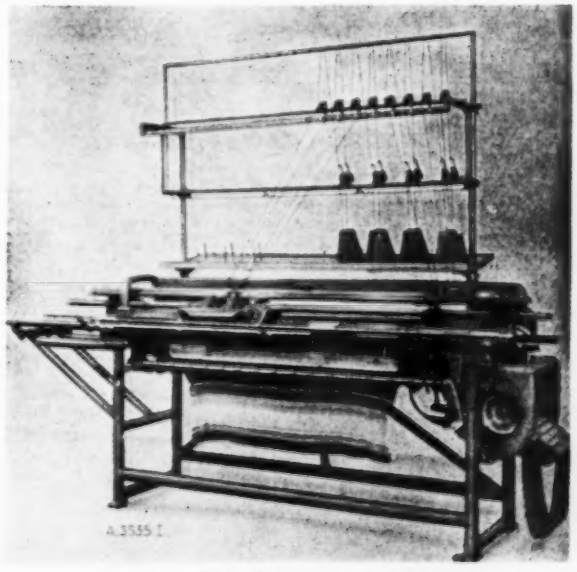

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NEW TEXTILE PATENTS

CHEMSTRAND GETS PATENT ON NEW MELT-SPINNING APPARATUS — New melt-spinning apparatus for use in producing filaments from a thermoplastic filament-forming polymer invented by Joseph A. Briggs Jr. and Robert L. Gardner, both of Pensacola, Florida, has been granted U.S. Patent No. 2,979,-766. The patent has been assigned to the Chemstrand Corp.

The new apparatus comprises a spinneret for extruding the polymer in a molten condition into streams in a path extending downwardly along a vertical extrusion line at a predetermined extrusion rate. The resulting filaments are collected in package form at a predetermined collection rate at a position below the spinneret. The spinning chamber has a top panel through which the spinneret projects and is adapted to receive the streams of polymer immediately upon extrusion. A cooling gas is directed laterally against the streams of polymer to cool them and with sufficient force to cause them to assume an arcuate path curving from the extrusion line. A rotatably mounted bristled brush, positioned in the area defined by the extrusion line and the arcuate path, contacts and retains the filaments at a rate less than the extrusion rate and at a rate less than the collection rate when denier reduction occurs in producing the filaments. As a result, the filaments become broken between the brush and the collecting means, and collect in a heap interjacent to the spinneret and brush when denier reduction occurs.

* * *

PATENT GRANTED FOR PRODUCING TWIST LIVELY THREAD —A new process for preparing twist lively thread of linear polycondensation products invented by Barend van der Bergh and Cornelis Jan Stadig, both of Arnhem, Netherlands, has been granted U. S. Patent No. 2,993,-333, which the inventors have

(*Continued on Next Page*)

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The new process for preparing twist lively thread consists of continuously supplying undrawn and substantially untwisted monofilament thread of a given denier to a drawing zone. In the drawing zone the untwisted thread is drawn to reduce its denier. In the next steps the untwisted thread is dry heated, cooled and collected while imparting twist to it. Thereafter the drawn and twisted monofilament thread is further twisted to a twist lively condition.

PROCESS PATENTED FOR MAKING FELTED FABRICS FROM KNITTED GOODS—A process for making felted fabrics from woven and knitted goods invented by George Leslie Moler, Wilmington, Delaware, has been granted U. S. Patent No. 2,991,536. The patent has been assigned by the inventor to E. I. du Pont de Nemours & Company, Inc.

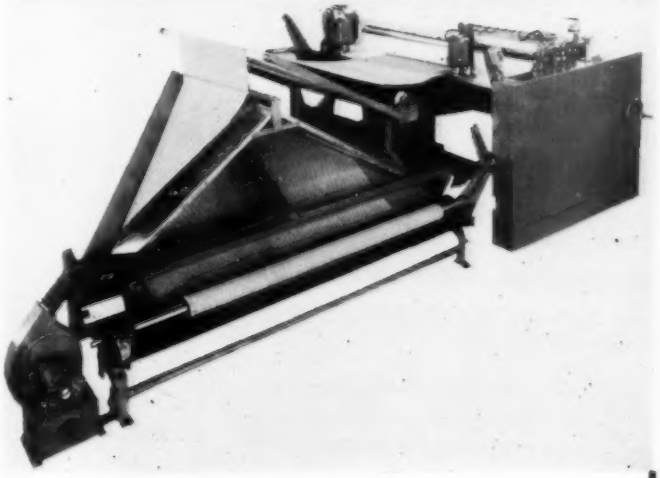
The new method of making a novel fabric having physical properties and appearance similar to felted wool fabric utilizes fabric made up entirely of woven yarns or fabrics made up entirely of knitted yarns. The yarn fibers of the fabric are composed of at least about 80 per cent of scale-free staple fibers. The fabric of such composition is subjected to a multiple needling treatment for moving a substantial portion of yarn fibers loosely into interlocking arrangement with fibers of adjacent yarns throughout the thickness of the fabric. Throughout the needling treatment the penetrating needle and fabric are maintained in fixed lateral relationship so as to produce a fabric in which intermingled and interlocked fibers provide improved fabric uniformity, covering power and stiffness.

NEW PROCESS PATENTED FOR SHRINKPROOFING WOOL — A new process for shrinkproofing wool textiles with trichlorocyanuric acid or dichlorocyanuric acid invented by Milton J. Scott, Lexington, Mass., has been granted U. S. Patent No. 2,993,747. The patent has been assigned by the inventor to Monsanto Chemical Company.

The new process for shrinkproofing wool textiles comprises contacting the material with an aqueous dispersion having a pH of from about 0.25 to about 9.5 and a temperature of from about 5 degrees to about 75 degrees C. The aqueous dispersion consists of water and a substance selected from the group consisting of trichlorocyanuric acid and a mixture of this acid and dichlorocyanuric acid. The treatment is continued until the wool textile material becomes resistant to shrinking and felting.

NEW PROCESS PATENTED FOR SPINNING AND DRYING ACRYLIC FIBERS. A process for spinning and drying fibers of a polymer containing a significant amount of acrylonitrile polymerized in them, invented by Andrew T. Walter of Charleston, W. Va., has been granted U. S. Patent No. 2,988,419. The patent has been assigned by the inventor to Union Carbide Corporation,

The new process is designed for continuously producing textile filaments and yarns having low solvent content and free from interfiber fusion from a vinyl polymer in which at least one component is acrylonitrile present in a significant amount polymerized therein. The process includes the steps of extruding a dope consisting of the polymer dissolved in a spinning solvent boiling below 100 degrees C. through a spinneret to form fibers containing less than about 20 per cent by weight of residual solvent. The formed fibers are subjected to direct contact with a heated surface maintained at a temperature of at least 60 degrees C. and between five degrees C. and 20 degrees C. below the fusion temperature of the fiber at the point of contact with the heated surface. The temperature of the surface to which the fiber is in contact is increased by increments at a rate such that the fiber contacting surface is maintained at least five degrees C. below the fusion temperature of the fiber at such contacting points to a final surface temperature between 135 and 190 degrees C. and until the fibers have a residual solvent content of less than about two per cent by weight and a fusion temperature of at least 150 degrees C.



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Sewing

Improved Lewis Tacking Unit

CHICAGO, Ill. — A new, improved Union Special-Lewis machine, Style 150-230, a non-skip stitch blindstitch machine has recently been announced by Union Special Machine Company. This machine has been designed to supersede Style 150-23.

The basic improvements in this high-speed blindstitch machine consist of a new cylinder that is movable and drops away for loading work and two separately adjustable ridge formers for precision control of every stitch.

Style 150-230 makes a long, loose, flexible stitch which keeps coat fronts in shape, preserving the garment's style lines. Facing can be stitched any distance from edge to meet individual requirements. When used for hemming bottoms of women's open-lined coats finished with pinked edge, the stitch is hidden between turned up pinked edge and body of coat and is invisible from either side of the garment. For circular operations such as cuff tacking on women's coat sleeves, the work plate is removable. The small cylinder circumference permits easy handling and control of work.

Union Special Offers Two 39500 Overedgers

CHICAGO, Ill. — Two new Class 39500 overedgers have been introduced by Union Special Machine Company, manufacturer of industrial sewing machines. Machine Style 39500 AG produces seam Type EFe-1 and is intended primarily for hemming baby blankets and other articles with a decorative stitch and turned up rolled hem with the hem extending to the right needle. The other machine, Style 39500 AH produces seam Type SSa-1 and is designed for seaming coat linings and pockets.

Both machines are two-needle, four-thread machines that produce the highly decorative stitch Type 506, modified. With the addition of these two machines, Union Special now of-

(*Continued on Next Page*)

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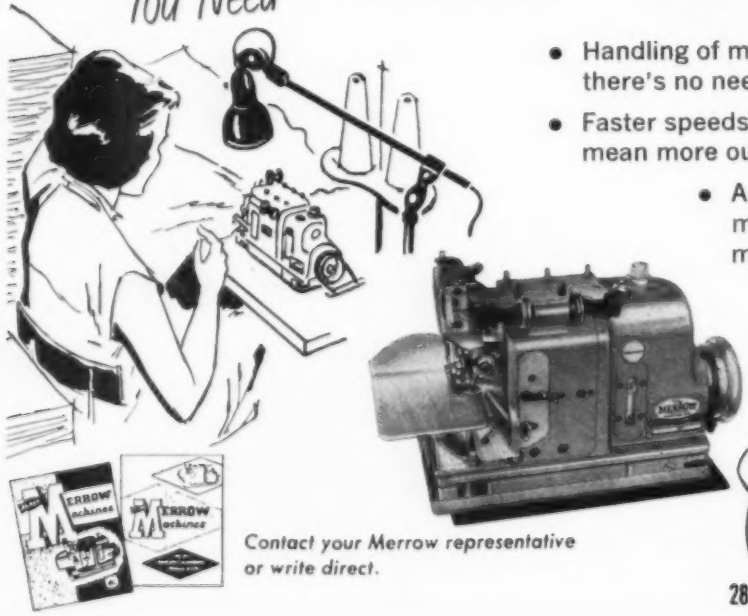


- Handling of material is easier . . . there's no need to **force** work through machines.
- Faster speeds (up to 5,500 stitches per minute) mean more output.
- Automatic lubrication assures maximum production with minimum "down time".

Contact your Merrow representative or write direct.

TRADE MARK REG

The **MERROW MACHINE COMPANY**

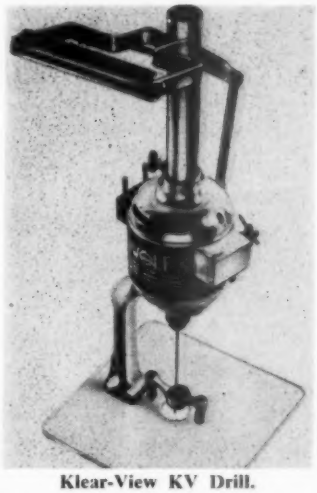
2824 LAUREL ST. • HARTFORD, CONN. • U.S.A.

fers the industry a total of 26 machines for overseaming, hemming and serging in Class 39500.

New Plastic Drill Base Designed For Accuracy

CINCINNATI, O.—A new drill with a clear plastic base for reportedly faster mark location and more accurate drilling has been announced by The Wolf Machine Company, Cincinnati 6, Ohio.

The Klear-View KV drill has a knee-action lever to facilitate handling and accuracy. Capacity is four, six, or eight inches.



Klear-View KV Drill.

Slide Fastener Co. Moves Assembly Operations

PHILADELPHIA, Pa.—Talon, Inc., will move its local assembly operation to a new 10,000 square-foot plant to be built near the International Airport, here. The building will have office, manufacturing and warehouse space. The zipper manufacturer is currently located here at 2536 North Broad St. It plans to add to its present force of 30 employees.

Braunlich In New Position At Avisco Fibers Division

PHILADELPHIA, Pa.—Richard H. Braunlich has been appointed manager of research and development for the Fibers Division of American Viscose Corporation. Mr. Braunlich's new position will place him in charge of all the Corporation's current rayon and acetate research and development operations at the Marcus Hook, Pa., research center.

THE "RELIABLE FELLOW" SAYS:

OVER 500 THREAD COLORS ALWAYS IN STOCK

REMEMBER TO CALL RELIABLE

40/3 Sewing Thread . . . Nylon Sewing Thread . . . Nylon Separating Thread . . . Dacron Separating Thread . . . Soft & Merc. Ktg. Cotton . . . Kismet—Seam Binding . . . Pintickets — Labels — Tags . . . Elastic — Cleaning Fluid . . . Paper — Twine — Wax . . . Pressing & Cutting Supplies . . .

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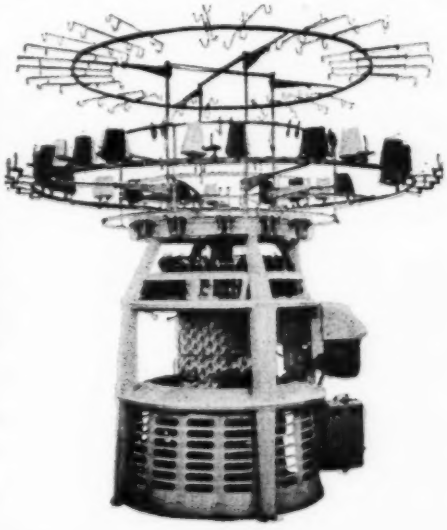
NORTH BERGEN, N. J.
N. Y. Phone: LO 4-7120
N. J. Phone: UN 5-3116



STITCH TRANSFER MACHINES
HAND FLAT KNITTING MACHINES
NEEDLES and ACCESSORIES
EARLY DELIVERIES

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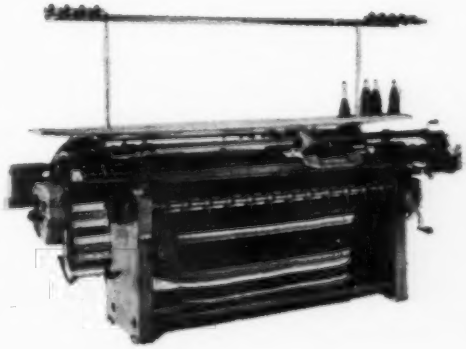
ALEMANNIA-SEYFERT & DONNER
Western Germany
Fully automatic single lock flat power machines, 3-14 cut, 64" and 71" needlebeds, for garments and trimmings



GEORGES LEBOCEY & CIE.
France
Circular machines for Jacquard, Double Jersey, Links/Links, Interlock and Eightlock fabrics and garment lengths

A&E *has your knitting and weaving problems well in hand*

DOUBLE knits are DOUBLE good

in A&E COTTON ICE™ *dyed mercerized yarn*

Double knits look their fast-selling best in smooth, lustrous A&E Cotton Ice Dyed Mercerized Yarns. For excellence of hand and superlative coloring, always specify A&E Cotton Ice. See your A&E man today for . . .

- **COTTON YARNS combed, carded, Durene® mercerized, dyed, bleached, gassed**
- **SPUN FIBERS YARNS wools, synthetics, blends**
- **TEXTURED YARNS Ban-Lon®, Antron®**
- **INDUSTRIAL SEWING THREADS**
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Combed • Carded • Durene® Mercerized • Dyed Yarns • Worsted • Orlon • Outerwear Blends • Textralized Yarn for Ban-Lon Garments • Industrial Sewing Thread • Circular Knit Finishing

Trade Statistics

Sweater Shipments In June Decline

WASHINGTON, D. C.—Sweater shipments in June rose appreciably over the preceding month but were down slightly from shipments in the corresponding month in 1960, the Bureau of Census reported last week.

Average weekly shipments of men's sweaters during June amounted to 42,000 dozen, an increase of 31 per cent over average weekly shipments the previous month and down five per cent from average weekly shipments in June 1960.

Shipments of women's, misses' and juniors' sweaters in June totaled 865,000 dozen as compared with 442,000 dozen in May and 922,000 dozen in June, 1960.

Wool

Fiber Consumption Down On Spinning Systems

WASHINGTON, D. C.—The weekly average rate of fiber consumption on the woolen and worsted systems in June was seven per cent below the May rate and two per cent below the comparable month of 1960, according to the Bureau of Census. These figures exclude the production of man-made fiber top from tow without combing.

The weekly average raw wool consumption in June was 7,882,000 pounds, scoured basis, or six per cent below the May level and four per cent above the June 1960 rate.

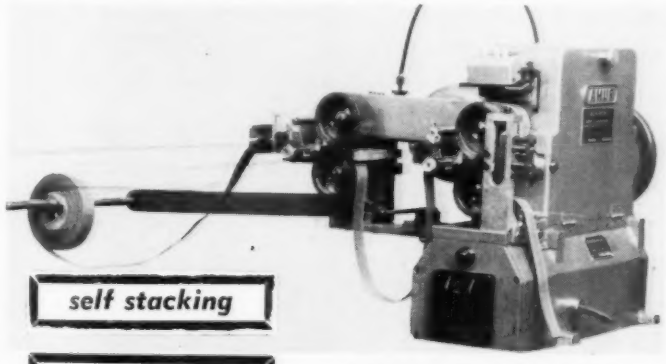
Consumption of apparel class wool was five per cent below the May rate.

Consumption of fibers other than raw wool averaged 5,000,000 pounds per week. This was 10 per cent below the rate of consumption for the previous month and nine per cent below the June 1960 rate.

Gov't Procurement

Opening Bids Sept. 7 For Wool Knit Shirts

PHILADELPHIA, Pa.—The Military Clothing and Textile Supply Agency will open bids September 7 at 11 a.m. under QM-169 for 12,012 men's wool knit shirts—OG 108.



self stacking

automatic

Production . . .

Length of Cut	Pieces Per Hour
2-4 in.	10,800
12-20 in.	3,600
20-44 in.	1,800

RIBBON & BAND CUTTING MACHINES

- CUTS RIBBON — NARROW BORDERS & ELASTICS Rapidly, Accurately, Economically
- CUTS & STACKS AUTOMATICALLY
- STOP MOTIONS INCLUDED
- RANGE FROM 1" TO 44"

MONTROSE

SUPPLY & EQUIPMENT CO.
div. of Montrose Oil & Belting Co., Inc.
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ALL ABOARD THAT'S GOING ABOARD . . . .

This announces your last opportunity to get aboard the
KNIT GOODS INDUSTRY'S GROUP CHARTER FLIGHT
arranged by the Association for members who wish to attend the
KNITTING MACHINERY SHOW in MANCHESTER, ENGLAND, OCTOBER 11th - 22nd

Note the following arrangements:

1. The flight will leave from International Airport, New York City, on Friday, October 6 — arriving in London several days in advance of the opening of the Show, to permit sight-seeing.
2. The plane will return to New York on October 22 — from Paris.
   These arrangements are made for the convenience of travellers who will have business on the continent as well as in England.

   Depending upon the number of reservations received — and judging from present prospects — it is likely that the total cost of the round trip will be about $275.

To make your final reservations (Deadline September 1st) use this coupon accompanied by a $100 deposit per seat:

NATIONAL KNITTED OUTERWEAR ASSOCIATION
386 Park Avenue South, New York 16, N. Y.

Please reserve ..... seats on the Group Charter Flight to Europe. Deposit of $100 per person is enclosed herewith.

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QUALITY
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Of course, we think so,
But more important,
Our customers tell us . . .
That MERCURY is the
House of Quality
Novelty Yarns of all fibers.

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The House of Quality Novelty Yarns

Knit Shirts

Munsingwear, Inc., Introduces Boucle Nylon/Cotton Bowling Shirts

MINNEAPOLIS, Minn. — Following a full year of research, Munsingwear, Inc., of this city has introduced an exclusive new fabric to its 1961-62 line of knit bowling shirts.

The firm, which introduced its first bowling shirt line in 1958, offers five newly styled shirts with the Lady Penguin, Lord Penguin and Penguin Jr., providing matching shirts for men, women and children. These retail at $5.95, $6.95 and $3.95, respectively. Colors include bamboo, peacock, black gold, light blue and white, and all have contrasting trims.

The deluxe Emperor Penguin retails at $8.95 and is available in white with either black, purple or red trim. This is a button down the front shirt, while the others are slipover models.

King Penguin, which is available in solid beige, gold, sage or white, is priced at $5.50 and completes the style range.

All shirts except the King Penguin, which is offered in 100 per cent two-ply lisle, come in the boucle or crepe stitch fabric. This is an 80/20 cotton-nylon blend which, while remaining cool and porous, provides a strong base ideally suited to embroidery, company officials pointed out. It also offers drip dry, no iron features.

Designed with Munsingwear's exclusive action gusset, the shirts' appeal to bowlers is enhanced further by treatment with Scentry-Gard, an American Cyanamid purifying agent.

Personals

Larry Speizman Spends Two Weeks In Air Guard

Larry Speizman, of the Spiezman Knitting Machine Corporation, is spending two weeks in the Air National Guard in New York State.

During his absence, Shelly Ritter is substituting.

Proven Best...By Test...In Leading Mills!

EFFICIENCY'S
Automatic Bartacking and
Trimming Attachment . . .

THE
"TAC-TRIMMER"
(U.S. Patent #2,849,974)

lets you bartack and finish merrow and cup seams on sweater sleeve cuffs, rib waistbands and collars IN A SINGLE OPERATION

- Will give you a custom finished garment with inexperienced help.
- An amazing time saver.
- A single operator can bartack and trim 150 dozen sweaters per day.
- Eliminates separate thread trimming or clipping.
- Eliminates pulling back, through itself, the overseam thread overrun with a knitting needle or hook.
- We can supply this device for attachment to the Singer #269-W9 Bar Tack Machine, the Pfaff 3334-1 Bar Tack machine and the Reece S2 Bar Tack or buttonhole machine.

We'll be pleased to demonstrate this amazing cost-saving device at your convenience.

EFFICIENCY DEVICES
262 Greene Ave., Bklyn. 38, N. Y. NEvins 8-6984

CALL US AT PENNELL

FOR TOP PRICES ON
MEN'S AND BOYS'
- SWEATERS
- SWIM TRUNKS
- POLO SHIRTS
- WALK SHORTS

WE'RE ALWAYS OPEN TO BUY
..WE ALWAYS BUY FAIR!

Pennell Sportswear Co., 1384 Broadway, New York 18 • LA 4-9020

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KNITTING YARNS
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ORLON® ACRYLIC — FUR BLENDS — LAMB'S
WOOL/ORLON — WOOL — MOHAIR BLENDS
300-322 BUTLER ST., B'KLYN 17, N. Y. • MAIN 5-2700, 1913

THE INDUSTRY'S MARKET PLACE

Advertising rates: $5.50 per column inch per insertion. Positions Wanted: $5.00 per column inch per insertion. Minimum space — 2 inches. Ads for Monday's paper must be in by preceding Wednesday, 2 P.M. Please enclose payment with your order.

MILL EQUIPMENT, MACHINERY—FOR SALE, WANTED

MACHINERY FOR SALE

1—Philip, 14 cut, 30" 32 feed
1—Wildman PB-2, 21", 8 cut
2—Jacquard LH, 30", 7 cut
1—Jacquard TAI, 14 cut, 12 stripers
1—Scott & Williams MFRC, 30", 14½ cut
1—Jacquard AI, 16½ cut, 32", 32 feed
2—Universal Supramats, 63", 4 cut
2—Jacquard TA-12, 30", 10½ cut
1—Jacquard TA-12, 30", 11 cut
1—Jacquard TJ, 28", 8½ cut
1—Lamb, 10 cut border machine
1—Jacquard TAI, 12 cut, 12 stripers
10—Lamb, Dubied, Grosser machines, 5-14 cut
1—Universal 6 spindle backwinder

Write, Wire or Phone

SPEIZMAN
KNITTING MACHINERY CORPORATION
350 Fifth Ave., New York 1, N. Y. PE 6-0930-1

WANTED

Late model full-fashion knitting equipment. Must be long section machines 21 or 30 gauge. Give full particulars as to manufacturer, date, gauge, sections and price.

BOX 360J

MACHINERY WANTED

Used Dubied flat knitting machines 4-7 cut. Write giving all details to:

GREEN BROS.
101 W. 31 St., New York 1, N.Y.

MACHINERY FOR SALE

2—Wildt RSB, 20" dia., 8 npi, 6 feeders and stripers, motorized.
6—Wildt RTR, 15", 18" and 20" dia., 4 feeders, stripers, motorized.
1—Wildt Leda, 26" dia., 17 npi, 12 feeders, 12 stripers, (24 feeders on plain fabric), 12 inlay feeds, 12 pattern wheels, motorized.
2—Wildt, Model E, 4" x 156", with interchangeable cylinders in 168 needle, 7SR3.
6—Wildman, type FBSS, 21" dia., 18" dia., 28 needle, 8 feeds.
6—Mellor Bromley Interlock, type 3 RLM, 17", 18", 20" and 22" dia., motorized.
4—Samco Fully Fashioned Outerwear Machines, 27 gauge, 12 sections.
4—Stibbe Interlock, type PBDR, 16", 18", 20" and 24" dia., feedwheel, stopmotion, motorized.
2—Komet, type JL, 4" x 176", with all attachments.
4—Komet, type JL, 3½" x 160", 3" x 136", 3¼" x 144", 3¾" x 168", with all attachments.
1—Komet, type LT, 3½" x 76", with all attachments.
6—Komet, type LT, 3½" x 200", with all attachments.
4—Komet, type LT, 3½" x 156", with all attachments.
4—Komet, type LT, 3¼" x 48", with all attachments.
4—Komet, type LT, 2¾" x 140", 2½" x 128", 3" x 152", 3¼" x 164", with all attachments.
7—Komet, type BR, 4" x 168", with all attachments.
3—Komet, type BR, 4¼" x 84", with all attachments.
5—Komet, type CP, 3" x 104", 3¼" x 112", 3½" x 120"

Be Wise — Buy Wagstaff — Established Since 1832

WAGSTAFF & SON LTD. . . . . LEICESTER, ENGLAND
Telephone: Leicester 58061 Cables: "PRINCE" Leicester

FOR SALE

7—PHILA. JACQ. TAI, 12 feed, 30", int. and trans. 12-4 color, 48 end stopm. Motor drive, 12½, 13, 13½, 14, 15, 16½ cut. Will set up on double jersey pique if required
5—PHILA. JACQ. TA-24 feed, trans., 32", 7, 7½, 11¾, 12½, 16 cut, stripers, motor drive. Will change cut or set up on double jersey pique if required.
2—PHILA. JACQ. AI-32 feed, 32", interlock body, 15½, 17 cut, 33 end stopm. and tensolators, motor drive.
1—PHILA. JACQ. LHB 30", L & L, 4 cut, 6 fd., 6-3 color stripers, motor dr.
4—PHILA. JACQ. TJ, 6 feed, Jacq. Trans. 28", 1-7 cut, 1-8 cut, 2-9½ cut, 4 col. stripers.
2—PHILA. JACQ. TA-4 feed, Transfer (Rib type) 1-15", 10½ cut, 1-16", 12 cut, 4 color stripers.
1—PHILA. JACQ. TA-8 feed, Transfer (Rib type) 20", 11 cut, 4 color stripers.
2—PHILA. JACQ. MLW, yard goods, 28", 11 cut, 24 fd., wheels, 12 feed, jacq. cards (PR type)
2—PHILA. JACQ. MLW, yard goods, 28", 1-11 cut, 1-16 cut, 24 fd., wheels, 12 fd. jacq. cards (PR type)
2—LEIGHTON TRANS. 4 fd., 1-15", 1-17", 12 cut, extra 9 cut Cyl. & dial, Brush attach., 2 color stripers
2—UNIVERSAL BACKWINDERS, Model 50L, 6 spindles each
1—DUBIED HAND MACHINE, 30", 7 cut

JACK FORSTADT
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Tel. GArfield 5-2563
Sales Representative for WILDMAN-JACQUARD COMPANY

FOR SALE–INDIVIDUAL ITEMS

Prominent Knitting Mill Owner Retiring

SANRO KNITTING MILLS, INC.

225 Taffee Place, Brooklyn, N. Y. (near Dekalb Avenue)

A complete plant consisting of knitting machines, sewing machines, pressing machines and cutting machines, boilers, winders, electric fixtures and all other items found in a plant of this kind.

ALSO: LOFT FOR RENT

For Information Contact:

MAC M. ROTHKOPF

317 Bushwick Ave., Brooklyn, N.Y.

HY 7-1486 Mill Phone MA 2-9048

BEST JK BUYS

See the New Mestre Flat Machine

1—Philip Mach., 17½ cut, 30", 32 Feed
1—Scott & Williams MFRC, 16½ cut, 30", 32 Feed
4—Phila. Jacq. LH Machs., 6 & 7 Cut, 30", 6 Feed
1—Supreme BRW, 6 cut, 16 Feed, stripers & wheels
2—Phila. Jacq. TJ Machs., 7 & 8 Cut, 28", 6 Feed
2—Phila. Jacq. TJ, 16" 7 Cut, 4 Feed, 4 Col Strip
6—Phila. Jacquard TAI Machs., 10, 12, 13, 13½, 16½ Cut, 30", 12 Feed
3—Phila. Jacq. TAI, 6 cut, 30", 12 Feed
4—Phila. Jacquard TA Machs., 10, 11, 12, 13 Cut, 30", 12 Feed
1—Philadelphia Jacquard MLW, 28", 11 Cut, 24 Feed, Wheels and Jacquards
1—O.G. Multi-Feed Jersey, 1x1 Rib, 8 Cut, 36 Feed, 32"
3—Leighton Machs., 22", 26", 28", 10 Cut, 6 Feed
2—Wildman PB2 Machs., 17", 18", 8 Cut
4—Tricoma flat machines, 4 cut, 62". Like new.
1—Dubied BAN Mach., 56", 12 Cut, Jacquards Front & Back
2—Dubied flat machs., 7 & 10 Cut, 40" & 48"
2—Stafford & Holt machs., 30", 32", 6 & 7 Cut, 6 & 12 Feed
1—60" Kastrinsky cal. machine
1—Dubied Doublehead border mach., 10 cut, chain rack
1—Queens Tandem Mach., 6 Cut, 50" heads
1—Backwinder, 6 spindles
1—Universal Rotoconer, 20 Spindles
5—Looping machines, model P, asserted points
1—McCreery Brush Mach., 60"

Joseph Kopelowitz, Inc.

APPRAISALS — LIQUIDATIONS — FINANCING

600 Broadway, Brooklyn 6, N. Y. EVergreen 7-1145

FOR SALE

6—Universal, 4 cut machines
4—Jacquard, 7 cut LH machines
6—O.G., 4-7 cut machines
All in excellent condition and currently operating.

BOX 359

MACHINERY FOR SALE

1—Stoll LIFADO, 8 cut, Links, 68"
3—Dubied BARB, 8 cut, V-Bed, 55"
All in excellent running condition
Call or write
M. A. KEFF KNITTING MILLS, INC.
132 Bergen Blvd., Fairview, N. J. WHitney 5-9152

KNITTING MACHINES— FOR SALE

4 TA 12 Cut—15, 16, 17, 19—4 stripers
3 TA 10 Cut—16, 17, 17—3 stripers
2 TJ 8 Cut—28 inch

MARBERN KNITTING MILLS, INC.
93 DeKalb Ave., Bklyn, N.Y. MAin 5-7444

KNITTING MILL FOR SALE

Perfect location in New York area. Complete with large knitting, finishing and sewing departments. With full backlog. Will consider cash or terms. Owner retiring.

BOX 360U

WANTED

1 — Double lock Queens machine, 10 gauge.
VARGEO, INC.
708 23rd St., Union City, N.J. UN 5-5600 (N.J.)
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COMPLETE KNITTING MILL FOR SALE

All machines are fully automatic. For information write to:
AMP KNITTING MILLS
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WANTED

Odd lots of cotton in 8/1, 9/1, 16/1 or 18/1.
Send information with best price.

BOX 350G

WANTED

20" Supreme Knitting Machines: 16 or 20 cut. Automatic striper or plain jersey. With or without pattern wheels.

SMARTEE, INC.
45 E. 12th St., N.Y. 3, N.Y. Mr. Brown OR 7-4160

MACHINERY WANTED

1 — LA or LH machine, 8-9 cut.

Call TAylor 7-7200 or Write BOX 360X

STAFFORD AND HOLT FOR SALE

7 Cut and Coarser

Set on medium and heavy bulky stitch.
32" dia., 6 feed. Rotary pattern wheels,
3 color stripers. Perfect running condition.

AX 1-5670 in New York City

EXCHANGE

Would like to exchange 4 - 14 point "P" Loopers, for 6-7-8- or 10 point Loopers. Will pay reasonable difference.

BOX 360C

FOR SALE

2—Jacq., TAI, 30", 13½ cut, 12 feed, like new.

BOX 360

YARNS WANTED, FOR SALE

WE BUY AND SELL

ALL TYPES OF KNITTING YARNS

WORSTED — ZEPHYR — ORLON

COTTON — OTHER SYNTHETICS & BLENDS

LEHIGH YARN Co.

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PHILA. 33, PA.
REGENT 9-5457

YARNS FOR SALE DIRECT FROM MILL BELOW MARKET PRICES

7,500 lbs.—2/26 7N Wool, Natural • 2/20's and 2/26's Wool, Assorted Colors
1/8 and 1/16 Cotton, Assorted Colors
All on cones

BOX 363

YARNS FOR SALE

6800 lbs.—1/30 zephyr National yarn, package dyed, cones, 4 colors

360 lbs.—1/5 run, 70/20/10 lamb's wool/ angora/nylon, natural, cones

BLUME KNITWEAR, INC.

30-02 48th Ave., L.I.C. 1, N. Y. · EXeter 2-7200 · Mr. Zanar

BLUESTONE YARN WINDING CO.

Coners of Orlons, Wool, Synthetics, etc.

CAN DELIVER 40,000 LBS. WEEKLY

For immediate service call EVergreen 7-1822

226 GRAND ST., BROOKLYN, N. Y.

NEW YARN OFFERINGS!

AT ATTRACTIVE PRICES

3000 lbs.—2/16 - 2/20, assorted colors and natural, Orlon, cones
3000 lbs.—1/28, Turbo Orlon, natural & colors, cones
1500 lbs.—18/1, Creslan, natural, cones
1500 lbs.—1/30, Creslan, natural, cones
1000 lbs.—3 run, natural, garnetted Orlon, cones
800 lbs.—3 run, charcoal, garnetted Orlon, cones
750 lbs.—1/26, 80% Orlon, 20% Wool, natural, cones
1000 lbs.—1.75 run, 100% Wool, black, charcoal and gold cones
1500 lbs.—3 run, 100% Wool, red, charcoal, biege, cones
1000 lbs.—2/10's, worsted, black and natural, cones
1200 lbs.—2/30's, black, worsted, cones
2500 lbs.—2/20's, 100% worsted, assorted colors, cones.

SAM SASKEN **CH 4-8733**
1441 Broadway, New York 18, N. Y.

YARNS FOR SALE

2/12/11, Brustein yarn, dyed on cones at Royal
203 lbs. pumpkin, 91 lbs. baltic blue, 240 lbs. emerald green.

BLUE BIRD KNITWEAR CO., INC.
ORegon 5-1100

WE BUY SURPLUS KNITTING YARN

Machine and Hand Knitting Sizes

WALTER McCOOK & SON, INC.

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FOR SALE
ELASTIC YARN FOR KNITTING
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BEDFORD YARN CO.
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WANTED FOR CASH Worsted · Zephyr · Synthetics Cotton

We always carry a large stock of yarns, dyed on cones for immediate use.

CALL EV 8-8277
BEN BALIF

686 Flushing Ave.
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CENTURY YARN CO.

YARNS FOR SALE
1/13 - Pink Angora
1/5 - Beige Fur Blend
LAMGOLDPAER, INC.
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CONTRACT WORK, CONTRACTORS WANTED

CONTRACTOR WANTED

with 7 gauge Queens Tandem machines for cable work. Also contractor for intarsia work.

BOX 362

LAMINATING

Experienced textile laminating firm desires steady accounts using laminating textiles. Satisfaction guaranteed.

ATLAS LAMINATING CORP.
5 Whale Square, Brooklyn 32, New York

CONTRACT KNITTING WANTED

Knitting on 16 cut double knit fabric. Steady production required by well known knitted fabric firm. Work available through the Spring season.

BOX 353

CONTRACTOR SEEKS ADDITIONAL WORK
on 7 cut circular Links Jacquard and flat Links machines. Many years experience in making all kinds of sweaters.
FAIRVIEW KNITTING MILLS
1370 De Kalb Avenue, Brooklyn 21, N. Y. · HI 3-4030

ATTENTION JOBBERS!
Contractor looking for jobber to work exclusively with variety of flats, 4 and 5 cut equipment. Metropolitan area.
BOX 360F

CONTRACT WORK WANTED

in mending and shortening on all types of knitwear.

BOX 361

ADDITIONAL WORK WANTED
on double-knit and jacquard cloth. Many years experience in producing quality work at reasonable prices.
BOX 369

WANTED
Full-fashioned contractors for men's knitted shirts. Could use production, finished shirts, or complete in the greige. Can use large quantities at once.
BOX 360D

CONTRACTORS WANTED
to knit cable trim on double jacq. flat links machinery.
BOX 360AA

CONTRACT WORK WANTED
on 4, 6, 8 cut Jacquard machines. Any stitch any style, and yarn. Ladies', boy's or men's. Quality workmanship.
BOX 360K

CONTRACT WORK WANTED
on wool or Orlon interlock or jersey sweaters. Classics or novelties. Also light bulkies, and stripes.
BOX 360M

WANTED
Contractor with 7 cut flat links machines for cable sweaters. Can give continuous business in large quantities.
BOX 350A

HELP WANTED

WANTED

Top salary for an experienced forelady for a fine and bulky sweater mill. One that is willing to relocate in Los Angeles, California.

BOX 367

WANTED

DESIGNER — COLORIST

Top rated circular knitting mill in New York City desires person with experience to do designing on Supreme and Brinton equipment. Salary commensurate with ability.

BOX 360W

STYLIST WANTED

A leading children's sportswear house with a national reputation for better goods, desires an individual who wants the challenge of creating a complete coordinated sweater line. This is an unusual opportunity and our organization knows of this ad. Please write full particulars in first letter giving background, experience and references.

BOX 368

SWEATER MERCHANDISER AND PRODUCTION MAN

To work with manufacturers and contractors. Expanding organization entering men's and boys' sweater field. Unusual opportunity.

Detailed replies will be held in strict confidence. Address Mr. Galston

WONDERKNIT ! 112 West 34th Street New York 1, New York

WANTED—TOP MECHANIC AND KNITTER

To operate and take full charge of established mill in New York area. Wildman spring needle, P. R. and Supreme circular knit fabric plant. Must know every phase including yarns, finishes and styling. Will consider partnership to the right man. Unusual opportunity. Write at once.

Full history for interview in New York.

BOX 360G

FINISHING FORELADY WANTED

Fully experienced in assembly of Full Fashioned and Cut- and Sewn ladies' knitwear of the highest quality. A mature person, a good teacher and leader will secure an excellent position with growth possibilities. Required by our South California Client. Please reply in confidence to

TED A. PODBERESKI & ASSOCIATES
701 Western Savings Fund Bldg. Phila. 7, Pa.

KNITTER-MECHANIC WANTED

Experienced on Circular Jacquard TAI and TA. Excellent opportunity for right man. Pleasant southern community. Call or write

RELIABLE MILLS, Gastonia, N.C. UNiversity 4-5761

SALESMEN WANTED

Textile laminating plant requires salesman for New York City area. Must have experience in selling textile laminating products to trade.

BOX 360T

PRODUCTION MAN - PATTERN MAKER WANTED

Well established manufacturer of ladies' knitted suits has opening for first rate individual capable of managing production and quality. Give full particulars in first letter.

BOX 360B

KNITWEAR DESIGNER WANTED

Experience preferred on sweaters by top infants' and children's wear house. Permanent position, good salary. State experience.

BOX 358

WANTED

Experienced shipping clerk.

YOnkers 8-4750

FORELADY WANTED

in knitting mill located in Metropolitan N. J. to supervise production, operating, and finishing on knitted suits and dresses.

Call HUbbard 7-5874 (in N. J.)

CUTTING ROOM FOREMAN WANTED

To supervise diversified cutting room of large men's cut and sew sweater plant. Submit qualifications and salary requirements in first letter. All replies confidential.

BOX 365

FINISHING ROOM FOREMAN WANTED

To supervise examining—mending—pressing—folding—of cut and sew sweaters. Must have quality experience. All replies in strictest confidence.

BOX 366

WANTED: INDUSTRIAL ENGINEER

Experienced to manage Sewing and Finishing Department of a large sweater plant. Must be willing to re-locate. All replies in strictest confidence.

BOX 364

POSITIONS WANTED

SUCCESSFUL KNITWEAR PRODUCTION EXECUTIVE AVAILABLE

Thorough knowledge of cost, yarns, quality control and styling. Am respected among contractors and spinners. Capable of handling complete operation from trimming to box.

BOX 360Z

ASSISTANT PRODUCTION MAN AVAILABLE

Presently employed by sweater mill as floor manager. Thoroughly experienced in cotton trim and sweater production. Wishes position with progressive firm with opportunity for advancement.

BOX 360A

PRODUCTION-FOREMAN SEEKS POSITION

Experienced in pattern making, cutting, sewing, quality control. Piece work rating, train, supervise and coordinate men's, boys' and ladies' sweaters. Will relocate.

BOX 360E

CREDIT MAN—OFFFICE MANAGER

Controller. Payroll and employee supervision. Handle all correspondence. Three years with top knitwear concern. References.

BOX 360Q

FOREMAN AVAILABLE

Production and quality man for sewing department. Can take complete charge of sewing, looping and all finishing departments. Able to relocate with reliable firm.

BOX 360R

BUSINESS OPPORTUNITIES

CAPABLE PARTNER WANTED

One who can take direct charge of going mill selling direct, doing business in excess of a million, successful operation. Must know inside thoroughly and efficiently.

BOX 360P

REAL ESTATE

FOR SALE OR LEASE

2 family building with store and furnished basement located in Ridgewood section of Brooklyn. Store and basement ideal layout and electrified for knitwear or dress manufacturer. Near all transportation. Labor plentiful. Immediate occupancy.

Call Mr. Bill VA 1-3663

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Satisfaction guaranteed.

MASTER STAIN REMOVER

68-56 Dartmouth St., Forest Hills 75, N.Y. Tel.: Llgette 4-0898

REPRESENTATIVES, LINES WANTED

REPRESENTATIVE WANTED

Established selling agents for large group of mills have opening for yarn salesman to specialize in selling dyed cotton yarns. Must be thoroughly experienced. Excellent opportunity.

BOX 347

TRADE WANTS

RATES: one insertion—35 cents per word. Words set completely in capitols — 40 cents per word. Box numbers count as two words. Minimum cost of advertisement—$5.50. Minimum cost of Positions Wanted advertisements — $5.00. Trade Wants for Monday's paper must be in by preceding Wednesday 2 P.M. Please enclose payment with your order.

Looping wanted. 7 point Sotco and "P" 7 and 15 point. Sanders Looping, 270 Irving Ave., Brooklyn, N. Y. HYacinth 7-7924

Contract work wanted. Only knitting for all types of Interlock knit goods. BOX 360DD

Knitter-mechanic available. Able to re-locate. Experienced on Dubied and Stoll machines. BOX 364DD

Contract work wanted on Ban-lon interlock, wool jersey machines, and LHB links machines for Bulkies, Men's and ladies' sweaters. BOX 360CC

Additional work wanted. On 4 cut flats. Complete garment or knitting only. Reasonable. BOX 360BB

For Sale: 2 Phila. Jacq. LH machines, 7 and 8 cut, 30". 6 feed. BOX 362EE

WANTED—KNITTED FABRIC MILL

A well established top flight knit fabric selling agent with attractive show rooms in N. Y. Capable sales force with ability and know-how to develop and style top line, is now available to diversified knit fabric mill.

If you can make a strong style quality line of fabric for men's, women's and children's trade, we can show you an unusual sales performance, large volume with the best top accounts on a national basis. Immediate business available. Write at once, full particulars.

BOX 360H

CLOSE-OUTS WANTED

CLOSE-OUTS WANTED

CASH PAID for surplus stocks of Sweaters and Bathing Suits

BERNETTE TEXTILE COMPANY

101 W. 31 St., New York City BRyant 9-5526-7

$$ CASH PAID FOR CLOSEOUTS $$

SWEATERS — POLO SHIRTS — SPORTSWEAR

Men's, Boys' Girls', Ladies' CALL US FIRST!

ARNA KNITWEAR, INC.

1265 B'way, N. Y. 1, N. Y. OR 9-1677

KNIT FABRICS CLOSE-OUTS WANTED

Top prices for solids, stripes and fancies.

S. LEVINE AND SONS

639 N. 2nd St., Allentown, Pa., HEmlock 5-3578

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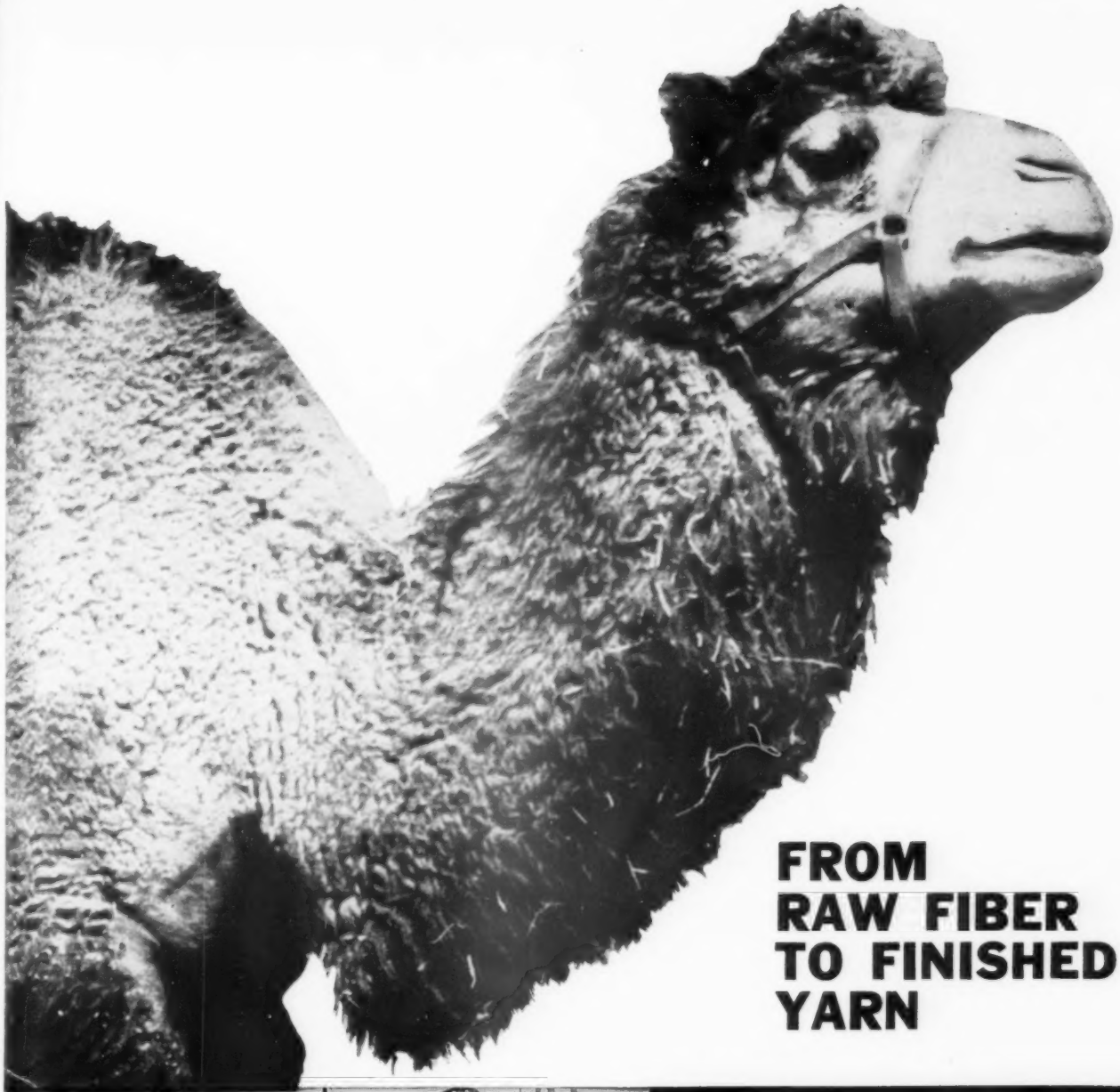

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When you buy from Woonsocket you are buying the best! Whether it be cashmere, camels hair, angora, fur blends, mohair, lambs wool or other specialty yarn, Woonsocket begins with the world's finest fibers. Woonsocket processes them in its own mills, under highly scientific control until the yarn is delivered promptly to your factory. Thus you are assured of an adaptable resource, able to meet the constantly changing demands of men's and women's fashions.

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